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Heat Treating at the Chevrolet Plant

Continuous Conveyor Furnaces with Drawing Chamber
Above the Hardening Chamber in a Single Combination Having One Combustion Furnace

ONE of the most important steps forward in the manufacturing processes in the automobile industry that has accompanied large quantity production of duplicate parts is the use of heat treating furnaces of the continuous conveyor type. Another outstanding development in this particular field is the installation of continuous heat treating furnaces of a new design recently made in the axle and gear plant of the Chevrolet Motor Co., Detroit. The furnaces were designed and erected by the McCann-Harrison Corporation, Cleveland.

This is a combination continuous hardening and drawing furnace of a double-deck type and an unique feature is that the drawing furnace is located above the hardening furnace and is fired by waste heat from the latter. After the conveyor delivers the work through the hardening furnace and into the quenching tank at the back of the furnace an elevator synchronized with the conveyor delivers it to the drawing furnace. The

combustion chamber is located between the hardening and drawing furnace making a combination over-fired furnace for high temperature and an under-fired furnace for low heats which is regarded as the most satisfactory arrangement.

This type of furnace has three outstanding features from the standpoint of economy. The utilization of waste heat saves the fuel ordinarily required for the drawing furnace, the floor space occupied is reduced over one-half with one furnace above the other and it requires only one man to operate the combined furnace unit.

The furnaces are used for heat treating rear axle shafts and pinion shafts made from chrome nickel steel. There are three units, one having a chamber 6 ft. wide inside, with a capacity for a single row of pinion shafts or two rows of axle shafts which are only about half the lengths of the pinion shafts. The other two furnaces have chambers 3 ft. wide or only wide enough for



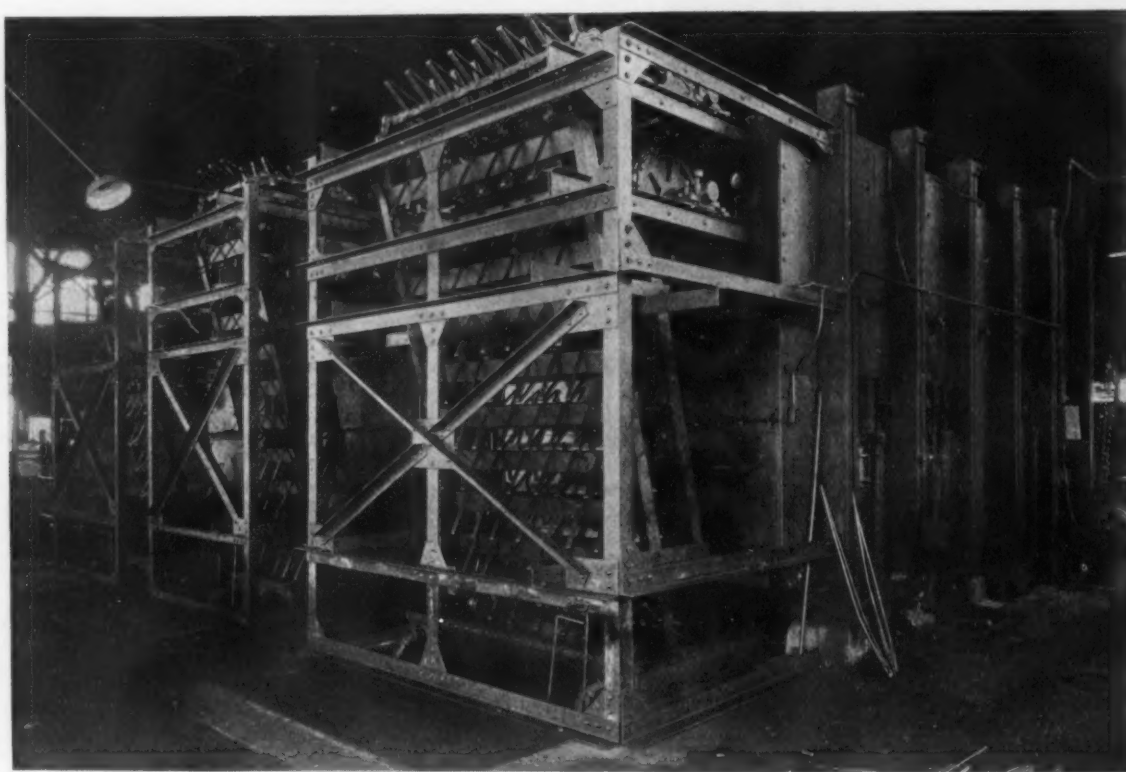
Continuous Combination Furnaces Used by the Chevrolet Motor Co., Detroit, for Heat Treating Automobile Shafts Are of a Double-Deck Type with the Drawing Furnace Above the Hardening Furnace and Utilize the Waste Heat from the Latter for the Drawing Furnace. The combustion chamber is located between the two furnaces. Work passes through the hardening furnace and back through the drawing furnace, the latter discharging the shafts into a curved chute that delivers them into tote boxes at the side of the front of the furnace

handling a rear axle shaft. The length of the hardening chamber in both the large and small units is 14 ft. inside. The drawing chamber in both sizes is of the same width as the heating chamber but 21 ft. in length, the increased length being necessary because of the longer time that is required for drawing.

Work is propelled through the hardening furnace on a conveyor beam, the large furnace having two beams and the smaller one a single beam. The beam is mounted on rollers which are carried on bell cranks and has a motion forward effected by a crank from 0 to 12 in. and a vertical movement of 3 in., $1\frac{1}{2}$ in. above and $1\frac{1}{2}$ in. below the hearth. By disconnecting the connecting rod that connects the crank and beam the latter can be pulled out for repairs. The beam is driven by a 5 hp. motor through a special speed reduction, giving a final speed on the crank shaft driving the conveyor of 1 r.p.m. The worm and reduction gears are inclosed

the hearth while the beam is making its lowering and backward stroke.

An interesting method has been provided for handling the shafts from the hardening furnace and through the quenching tank. When the work has reached the discharge end of the furnace the beam lays three shafts on the bottom of the hearth at its discharge end and the beam on its next forward movement discharges the three shafts into a tilting hopper which in turn on the next downward stroke of the beam discharges them to two lowering arms which deliver the shafts into the quenching tank. One end of the tilting hopper in one position also acts as a stop to prevent shafts lying on the hearth from being discharged into the hopper while the lowering arms are in action and this end of the tilting hopper in another position prevents the work from falling off the beam. With this device the shafts are always kept in line and cannot be turned



A Rear View of the Furnaces. The shafts pass from the hardening chamber into a tilting hopper and on to lowering arms which deliver them into a quenching tank and a finger type elevator carries them up from the tank to the drawing furnace

in a speed box at the side of the furnace and run in oil. The motor runs at a constant speed of 840 r.p.m. Push button control is provided at various points on the furnace.

The conveyor beam is made of structural steel with cast iron caps on which are mounted special tile that provide insulation for the beam. No metal projects from the beam into the chamber so that high temperature material is not required in any part of the conveyor construction. The slots at the side of the beam are baffled in order to prevent the cold air current from entering and the heat from escaping from the chamber. The tile is cored out to form flues and provide circulation. The slots at the side of the beam register with flues in the chamber floor that lead to flues in the side walls so that the products of combustion are drawn down through the work underneath the floor before being withdrawn from the furnace.

The work passes through the furnace in units of three, the largest taking two rows of axle shafts, one row on each conveyor, as previously mentioned. The operator lays the parts on the hearth at the charging end, and the ends of the shafts rest on the bottom of

crossways and possibly become entangled with the beam when passing from the furnace to the quenching tank.

The lowering arms are connected through links to bell cranks in such a manner that when the beams lower the arms move rapidly and there is a rapid lowering movement of the work from the tilting hopper to the quenching tank. As the arms go down the hopper opens, releasing the axles onto the arms.

The construction is such that the axles are rotated as they enter the oil which is essential in preventing warping. An important feature of the furnace is that the work is discharged directly to the quenching tank which gives assurance that it will be quenched at the proper temperature. The tilting hopper is made of Chromel metal, this being the only part of the furnace requiring high temperature metal.

A finger type elevator carries the shafts from the quenching tank to the drawing furnace. The lowering arms that deliver the work from the hardening furnace to the quenching tank disappear through skids at the lower part of their stroke allowing the shafts to be discharged on to the fingers of the elevators. The speed of the elevator is timed with the operation of the beam

conveyor so that the elevator fingers are always in the proper position to receive shafts when discharged from the lowering arms. The finger elevator is made of two strands of heavy malleable roller chain with heavy channels every 12 in. that carry the fingers.

The fingers carry the shafts around sprockets at the top of the elevator and they are delivered on to skids which in turn discharge them onto two conveyor chains running through the drawing furnace.

The elevator and drawing furnace conveyors are both driven from a jack shaft at the charging end of the furnace which in turn is driven from the motor that drives the hardening furnace beam. The drive is synchronized throughout so as to secure a proper operation of all intermittent movements as well as to provide the required speeds for the elevator and the drawing furnace conveyor. An important feature of the handling mechanism is that there are no gravity conveyors and the work is always under control thus preventing any mishap that might result from handling by gravity.

Axles are discharged from the drawing furnace into a curving chute that dumps them into a tote box at the side of the front of the furnace. This leaves all the space directly in front entirely free from charging the furnace.

The hardening furnace, heated by the overhead combustion chamber, has a perforated top arch through which the heat enters the furnace and is carried down through the work and through the flues in the beams and up through flues in the side walls to an intermediate chamber between the top arch of the hardening furnace and the floor of the drawing furnace. From the intermediate chamber the gases are conducted through flues to the drawing chamber and from there

to the atmosphere. Special dampers are provided for taking the heat directly from the combustion chamber to the intermediate chamber and from there to the drawing furnace in case waste heat from the hardening furnace does not give sufficient temperature to the drawing furnace. By-pass flues are also provided for carrying the products of combustion around the drawing chamber to the atmosphere should lower temperature in the drawing furnace be required. With this arrangement the temperature of the drawing furnace can be closely regulated at any point between 600 and 1200 deg. Fahr. Hardening is done at a temperature of about 1550 deg. and drawing at a temperature of 900 to 1100 deg. Fahr. Both the hardening and drawing furnaces are equipped with pyrometers. Each unit has four Powell intermediate pressure burners and oil is used for fuel.

The narrow furnace has a quenching tank 7 ft. 3 in. long, 4 ft. 2 in. wide and 5 ft. 6 in. deep. The tank connected with the larger furnace is of the same dimensions except the width which is 7 ft. 2 in. The quenching tanks have quick opening valves and large overflows so that they can be emptied quickly in case of emergency. For quenching 28 deg. paraffine oil is used.

Axles are charged into the small furnace at the approximate rate of three per minute making the capacity 180 shafts per hour. It takes about 155 min. for a shaft to go through both furnaces. It is in the hardening furnace 45 min., in drawing furnace 70 min. and in the quenching tank 2 min.

After leaving the drawing furnace every tenth shaft is given the Brinell test and in case the work does not show the proper hardness, it is then given another heat treatment.

Good Building Record in June

June building operations held up at a remarkably high rate, according to F. W. Dodge Corporation. Contracts awarded in June in the 36 Eastern States (including about seven-eighths of the United States total of construction volume) amounted to \$387,521,100. The decline for May was a little less than 8 per cent, and there was an increase of nearly 5 per cent over June of last year.

Construction started in these 36 States during the

Ultra-Violet Light Factor in Corrosion

That exposure of a polished metal surface to ultra-violet light may render it increasingly liable to corrosion is indicated by tests conducted by the Bureau of Standards, Department of Commerce. Specimens of Armco iron, medium carbon steel, stainless steel and high nickel steel were used for the tests and were exposed to the rays for eighteen hours. Moisture from the breath was found to condense differently on the exposed and unexposed surfaces, rendering the two

	Millions of Dollars	Contracts Let for Buildings in June —Per Cent Increase Over—		Percentage of Total				
		Over May	June, 1923	Residences	Commercial	Educational	Other Public	Industrial
New York and Northern New Jersey	91.5	—17	8	53	14	9	9	4
New England	34.1	—13	12	44	16	12	10	9
Middle Atlantic	40.2	—10	69	42	11	8	26	4
Southeastern States	56.2	—7	19	44	12	10	16	11
Pittsburgh District	51.8	—9	8	32	8	5	36	7
Central West	102.4	7	—15	34	22	9	19	7
Northwest	11.05	—5	—33	45	..	10	23	7

Minus sign signifies a decrease.

first half of this year has amounted to \$2,323,816,900, a record figure, being a 10 per cent increase over the first half of last year. However, the increase has not been general throughout the country. For instance, New York City has registered an increase of 83 per cent, while the territory outside of New York City has shown a general decline of 1 per cent. The New York and southeastern districts have shown substantial increases; New England's increase has been moderate; the Middle Atlantic States have just equalled last year's record; and the Pittsburgh, central western and northwestern districts have shown substantial declines.

All the important classes of construction except industrial plants have participated in the increase in construction volume. Industrial construction has declined considerably. Recapitulating the six months' record, the important groups were represented as follows: residential buildings, 48 per cent of the total; public works and utilities, 15 per cent; commercial buildings, 13 per cent; educational buildings, a little over 8 per cent; and industrial buildings, a little under 8 per cent.

A tabulation of the records here made shows how large a factor is residence construction and how small the building of factories.

easy to distinguish. On the exposed part the drops of condensation were larger than on the unexposed, and the surface looked as if a very thin film of oil had been spread over it, making it less easily wetted than is the unexposed surface.

In the case of medium carbon steels very noticeable corrosion of the exposed spot was found to occur after four condensations of moisture, while the rest of the surface was hardly attacked. Chromium and nickel steels did not show any corrosion, although there was the same difference in appearance between exposed and unexposed surfaces.

This phenomenon was discovered accidentally in the course of some tests being made for another purpose by the optics division of the bureau. Further investigations are contemplated.

The McKinney Steel Co., Cleveland, has taken bids for the construction of a four-story and basement office building, 260 x 60 ft., to be located at its plant. When completed the general offices of the company, which for years have been located in the Perry-Payne Building, will be moved to the plant.

International Foundry Exhibition at Birmingham

BIRMINGHAM, ENGLAND, June 30.—The second International Foundry Trades Exhibition organized by the Birmingham Chamber of Commerce, in conjunction with the Institute of British Foundrymen and the British Cast Iron Research Association, was opened on June 19 by R. P. Patterson, president of the Institute of British Foundrymen, at Bingley Hall, Birmingham. It is fair criticism to say that there was too much similarity between the present and the last exhibition also held in Birmingham two years ago, and the Paris foundry exhibition held last year did not differ greatly from either, although there were, naturally, more French and Belgian exhibits. Exhibitors complained that the attendance each day had been poor but, at the same time, they confessed that a fair amount of business had been done.

Molding Machines

A number of the exhibitors two years ago were absent from this exhibition, but their places were taken by other manufacturers of foundry plant with machines that were unique and interesting. There were a number of well-known types of molding machines on show, most of them in operation, but that which attracted most attention was the Beardsley & Piper sandslinger, which represented something quite new in British foundry practice. Being a machine that is of practical value to the small jobbing founder, who specializes in odd castings, it ought to have a big future in this country. Two different types were on view.

Pneumatic tools are quite common now in steel, iron and brass foundries in the United Kingdom, and the Glasgow firm of J. MacDonald & Co., in addition to a molding machine and a portable electric sand riddle with an elliptical motion, exhibited the Cleco air grinder, which is something new. It is fitted with ball bearings and is designed for foundries, boiler, bridge and structural shops. One type is for heavy work and another, called a pencil grinder, is for light work, the chuck holding a 1/4-in. emery stick; the whole machine only weighs 4 lb. The electric riddle mentioned is operated by simply connecting up to a lamp socket.

Repetition molding machines of well-known types

were exhibited, in some cases with improvements in details, but a machine operated on a new principle and called "It's it," was on the stand of J. M. Terry & Co., Birmingham. It is a hand jolt ram machine and should be useful for repetition work in either large or small foundries. It is operated by one man. The machine is jolted by means of a lever and four jolts are sufficient to ram a mold, while it is seldom that more than ten are required. The table is balanced with an oil compensation device and can be jolted without effort by a boy. The output of these hand jolters is high compared with any mechanically operated machine and a good draw is obtained.

There are very few British foundries with mechanical conveyors of any kind, which is surprising in view of the labor which they save and their comparatively low initial cost. An interesting exhibit was a gravity roller conveyor not the least merit of which was its extreme adaptability. Even in a jobbing foundry a gravity conveyor which can be moved quickly to any part of the foundry floor is invaluable for moving sand, molding boxes or castings.

In the fettling shop, also, the gravity conveyor should prove invaluable. At foundry exhibitions fettling machinery is always interesting and an exhibit of wire brushes on the stand of W. Canning & Co., Birmingham, attracted notice. The brushes shown will, it was claimed, wear down to the end plates, and can be run at 2200 r.p.m.

J. W. Jackson & Co., Ltd., Manchester, exhibited a cupola volume meter to give continuous reading of actual air volume passing to the cupola and also a new type of pressure gage. Another firm, George Green & Co., Keighley, showed their emergency cupolas while the models of German cupolas on the stand of Smeeton-Wright Furnaces, Ltd., London, were of exceptional interest. For a cupola with reversing regenerators 25 per cent saving is claimed in the coke charge over ordinary practice and a reduction of 25 per cent in the sulphur content of the metal.

A good display of woodworking machinery for patternmakers was made by a Belgian firm, Danckaerts Woodworking Machinery. This included a universal wood worker which planes, mortises, etc., but most of the operations that can be performed on the machine are more for carpentry than for patternmaking.

International Steel-Treating Exposition and Convention

For the sixth annual convention and international steel exposition of the American Society for Steel Treating, to be held on Commonwealth Pier, Boston, Sept. 22 to 26, inclusive, the Copley Plaza Hotel has been designated as the headquarters, and the plan of having technical sessions in the morning with the exposition closed will be followed again this year. All morning sessions will be held in the ballroom of the hotel, while the afternoon sessions and symposia will be held in the meeting room on Commonwealth Pier.

An honorary advisory committee, consisting of Hon. James M. Curley, mayor of Boston; Dr. Albert Sauveur, of Harvard University; Dr. S. S. Stratton, president Massachusetts Institute of Technology, and the president of the Chamber of Commerce, are co-operating with the local executive committee under the chairmanship of A. O. Fulton, vice-president Wheelock Lovejoy Co., Inc.

Reservations by manufacturers for space at the exposition are reported heavier this year than at any of our previous expositions. The show will be 33 per cent larger than at Pittsburgh last year. An interesting part of the exposition this year will be the number of exhibits in operation.

The railroads have granted fare and a half for the round trip, and certificates entitling individuals visiting Boston for the purpose of attending the convention and exposition may be secured from the society headquarters, 4600 Prospect Avenue, Cleveland.

British Empire Steel Changes

With the Sydney, N. S., and Trenton, N. S., plants of the British Empire Steel Corporation partly closed down owing to lack of orders, the corporation is taking advantage of the situation to make some needed and long deferred staff changes which will put the corporation in the position to produce more efficiently and economically when operation is fully resumed. For many years, through a series of changes in administration, official appointees have been accumulating until at the time of the last strike, one of the main grievances of the men was that they could not get higher wages because the plant was over-staffed and its earnings eaten up by officials, foremen and minor bosses of one kind or another. At present this situation is being remedied. In some departments two or three officials are found sufficient to take care of duties formerly divided between seven or eight. Urgent representations to Ottawa have resulted in a rail order which will avert the contemplated shutdown of the plant except for two or three weeks. The new order for 30,000 tons of rails for the Canadian National Railways will keep the mill going until next September, by which time general improvement in the steel industry is expected.

The Bethlehem Steel Corporation has placed a contract with Arthur G. McKee & Co., Cleveland, engineers and contractors, for electric ball operating rigs to be installed on Nos. 10 and 11 blast furnaces of the Bethlehem company at Johnstown, Pa.

Provisions for Publicity of Tax Returns

Important Features of the New Law, Including Posting of Names—Possible Effects on Business—President Coolidge Appoints Members of Board

BY L. W. MOFFETT

WASHINGTON, July 15.—Publicity of tax returns to a degree never approached since periods of the Johnson and Grant administrations, became effective under the new revenue act passed at the recent session of Congress. Strongly objected to by Secretary of the Treasury Mellon and other high Government officials, together with business interests generally, the publicity features were insisted upon by a dominating element in Congress which, in its political zeal, disregarded arguments made against this feature of the law. The point was made before the provisions finally were adopted that similar publicity of tax returns during the days of reconstruction following the Civil War played an important part in drying up business, injuring credit, and developing depression, but those insisting upon the provisions made all sorts of radical claims. They contended that publicity would prevent alleged false returns, and efforts at evasion, and compel taxpayers in appealing cases to make known all facts or discourage them from resorting to appeal unless there was sound ground for making it. It was even maintained by supporters of publicity provisions that it was a practice of some business interests to take cases before the Board of Tax Appeals of the Treasury Department and, their cases being heard and reviewed behind closed doors, there was always possible the element of an "understanding" between Government officials and representatives of those making the appeal.

Charges as to Former Employees

Particularly was the claim made that men who formerly were in the Treasury Department had taken advantage of their knowledge of the operations of the department to obtain unduly favorable decision before the board for their clients. While rules and regulations of the department provide a certain degree of restriction against practising before the board by former employees, it was urged that they have proven inadequate. So far as injuring business is concerned, supporters of publicity provisions pretend to scorn the idea.

The publicity provisions as finally adopted are rather sweeping but not so much so as had been proposed. Senator Norris, of Nebraska, had introduced and the Senate adopted an amendment which provided full publicity of all tax returns. This amendment was struck out in conference after a vigorous protest by Administration officials and strong objection from many sources throughout the country. The publicity provisions as finally adopted are so far reaching, however, that they are decidedly distasteful to the Administration, business interests, and assuredly to many taxpayers as individuals.

Three Publicity Provisions

There really are three publicity provisions. Each is considered to be broad in its scope. One of them creates a Board of Tax Appeals, part of whose personnel has just been appointed by President Coolidge and has been organized.

The new law provides that hearings before the board and its divisions shall be open to the public. If the amount of taxes in controversy is more than \$10,000, the oral testimony beginning at the hearings shall be reduced to writing and the report shall contain an opinion in writing in addition to the finding of facts and the decision. All reports of the board and its divisions, and all evidence received by the board and its divisions, "shall be public records open to the inspection of the public," according to the act.

The second provision, which is rated as a publicity provision, requires the Treasury Department to turn

over all tax reports, when requested, to the House Committee on Ways and Means and to the Senate Committee on Finance. While the impression has been given that these committees would not make the records public, there is nothing in the law to prevent them from doing so or from making them available to persons who might want to see them. The third provision requires that the names of all taxpayers and the amount of taxes paid be posted in the offices of collectors.

Anxiety as to Effects

Reaction from these publicity provisions is being awaited with interest and Treasury officials are said to be showing a certain amount of apprehension as to their effect. Among other things they have stated that the publicity question of tax returns may be easily used to unjustly injure the credit of business interests, especially smaller ones. The larger ones already publish the facts through reports to stockholders. For example, it has been pointed out, a certain relatively small manufacturing company might show a smaller return for a given year than had been shown the previous year, and on the face of conditions this might give the impression that such a company was moving backward and was making little or no profit. But, as a matter of fact, it was explained, it may have made investments in improvements, replacement and in other ways, showing distinct progress but providing for exemption allowances that would reduce the actual tax returns. The point also has been made that the publicity provisions will increase investments in tax-exempt securities and consequently will divert money from manufacturing and other enterprises and at the same time reduce the revenues of the Treasury.

Twelve members of the Board of Tax Appeals were appointed by President Coolidge. The act provides that the board shall consist of seven members "except that for a period of two years after the enactment of this act the board shall be composed of such members, not more than 28, as the President determines to be necessary." It is probable that the remaining members of the board will be appointed in the fall.

Seven of those appointed were selected from the personnel of the Bureau of Internal Revenue. The 12 named are Adolphus E. Graupner, San Francisco; J. S. Y. Ivins, New York; A. E. James, New Jersey; John M. Sternhagen, Chicago; Sumner L. Trussell, Minneapolis, Minn.; John J. Marquette, Washington; W. C. Lanadon, Salina, Kan.; Charles D. Hamel, Grafton, N. D.; Benjamin H. Littleton, Nashville, Tenn.; Jules Gilmer Korner, Jr., Winston-Salem, N. C.; Charles P. Smith, Boston, and Charles M. Trammell, Lakeland, Fla. Most of the appointees are lawyers or accountants, or both.

A man-cooling fan so-called for steel mills, foundries, forges and plants where heat treating processes are used has been brought out by the American Blower Co., Detroit. The new model fans are built in two sizes, wheels 21¼- and 37¼-in. in diameter, operating at 1725 and 1120 r.p.m., requiring 1 and 4 h.p. respectively. The fan resembles a giant size desk fan. It may be placed to blow a brisk current of air in any desired direction.

The Portland, Me., South Portland and Waterville shops of the Maine Central Railroad, employing several hundred men, have closed for a month. Other New England railroads are curtailing operations at their various shops.

MUSEUM OF ENGINEERING

National Organization Announces Campaign for \$10,000,000

One million dollars has been assured toward the establishment of the National Museum of Engineering and Industry, Inc., with headquarters in the Engineering Societies Building, New York. A campaign to raise an additional \$9,000,000 has been started. The president of the new organization is Dr. Elihu Thomson, who received last week the Kelvin gold medal from the Royal Society at the Kelvin Centenary in London. The vice-presidents are Dr. Edward G. Acheson, one of the creators of the modern abrasive industry; Dr. Leo H. Baekeland, inventor of Velox paper and Bakelite, and president of the American Chemical Society, and Dr. Edward Weston, creator of the Weston type of electrical instruments. Its trustees are Philip T. Dodge, chairman of the International Paper Co.; Howard Elliott, chairman of the Northern Pacific Railroad; Dr. Ira N. Hollis, president Worcester Polytechnic Institute; Dr. Elmer A. Sperry, president Sperry Gyroscope Co., and Worcester R. Warner, Warner & Swasey, Cleveland. George E. Roberts, vice-president National

City Bank, New York, is treasurer, and H. F. J. Porter, industrial engineer, is secretary.

In cooperation with the Smithsonian Institution the new organization is planning to erect on its grounds in Washington a building to house the original models of early inventions and the records of constructive achievement of pioneers, inventors and engineers in the development of transportation and industry. In this way the United States will be given the kind of institution which all the great European nations have possessed for years.

An important departure in the American scheme is proposed. In addition to the central collection at Washington special collections, such as replicas of the historical exhibits, will be carried to the people, also live machinery of modern processes will be placed in affiliated museums in industrial centers. Already old models and records have been located and resurrected and this winter will be exhibited at the headquarters as a demonstration of how the ultimate collection will appear.

Incorporation was effected in March last under the laws of the District of Columbia by an organizing committee of 100 composed of officers and engineers of industries and railroads and professors of engineering and history in universities and colleges.

Failure to Perform Spotting Service Is Disapproved

WASHINGTON, July 15.—Failure or refusal of railroads to perform spotting service on interstate carload traffic for or else to make an appropriate allowance to the Jackson Iron & Steel Co. was declared to be unduly prejudicial and unduly preferential of competing plants in a decision handed down last week by the Interstate Commerce Commission. The finding was based upon a rehearing and affirmed that portion of the original report which held as not unreasonable failure or refusal of the railroads to perform under their line haul rates to and from Jackson, Ohio, the spotting service on inbound and outbound interstate shipments to and from the company's blast furnaces, or to make the company an allowance for performing the spotting service. The holding of undue prejudice and undue preference was based on the fact that these services are performed at competing plants at Welleston, Lawrence, and Ironton, Ohio. The railroads in the case included the Detroit, Toledo & Ironton, the Baltimore & Ohio, and the Hocking Valley.

McKeesport Tin Plate Workers Strike

Other tin plate manufacturers having failed to follow the wage cut announced by the McKeesport Tin Plate Co., McKeesport, Pa., about two weeks ago, amounting to 20 per cent for tonnage men and 12 to 15 per cent in other classes of labor, the entire hot mill force of the company failed to report for work July 10, as a protest against the cut. Unless there is a speedy settlement, this will mean the suspension of the entire plant since other departments can work only as long as the supply of black plate lasts. The plant has been operating on a half time schedule since the wage cut went into effect and this has contributed to the trouble, since the men had expected full time work at the lower wage rates.

Wages in Iron and Steel Industry

WASHINGTON, July 15.—The Bureau of Labor Statistics, Department of Labor, has just issued Bulletin 353, "Wages and Hours of Labor in the Iron and Steel Industry; 1907-1922." It shows earnings per hour, customary hours of labor, and actual hours and earnings for one-day period in 1922, together with summary figures for preceding years taken from previous reports for 10 departments in the industry.

Taking 1913 to represent the index number 100, except for puddling mills, for which 1914 takes the

index number 100, a table in the bulletin strikingly shows the trend of wages in the industry. In the case of blast furnaces, the year 1919 represented the lowest average earnings per hour for the period, taking an index number of 83, while 1920 was the highest when it went up exactly 200 points to 283. In all cases 1920 was the year of the highest average earnings per hour.

The high and low index numbers covering average earnings per hour in the various departments for the period follow:

	Lowest Year	Index Number	Highest Year	Index Number
Bessemer converters.....	1908	79	1920	241
Open-hearth furnaces.....	1910-11	89	1920	282
Puddling mills.....	1915	96	1920	279
Bloomers mills.....	1910	81	1920	233
Plate mills.....	1911	87	1920	267
Standard rail mills.....	1911-12	89	1920	256
Bar mills.....	1908	84	1920	252
Sheet mills.....	1910	84	1920	229
Tin plate mills.....	1910	88	1920	252

Building Cars for Southern Railway

BIRMINGHAM, ALA., July 15.—The Chickasaw Shipbuilding & Car Co., subsidiary of the Tennessee Coal, Iron & Railroad Co., is now turning out the low side gondolas for the Southern Railway and the other cars ordered several weeks ago. The Louisville & Nashville Railroad Co. is also to get a large number of cars from the Chickasaw plant at Fairfield, the order of this company being estimated at \$4,000,000. The Virginia Bridge & Iron Co. built a number of flat cars for the Seaboard Air Line Railroad.

A typographical error reversed the meaning of one sentence in the communication of H. A. Schwartz, manager of research, National Malleable & Steel Castings Co., in THE IRON AGE of July 10, dealing with the reduction of annealing time in the production of malleable castings. The sentence in question and the two which preceded it are given below in their proper form: "It is difficult to say what value the various special, under-annealed products of Dr. Hayes may have. This is a question for the consumer rather than the producer. Dr. Hayes himself emphasizes their deficiency in shock resistance, the property which now gives malleable castings their greatest value."

Westinghouse Electric & Mfg. Co. is adding to its works at Mansfield, Ohio. Two buildings, which will be of steel construction, are to be erected which will increase the floor space of the plant by 140,000 sq. ft. The new buildings were designed by B. H. Prack, architect and engineer of Pittsburgh.

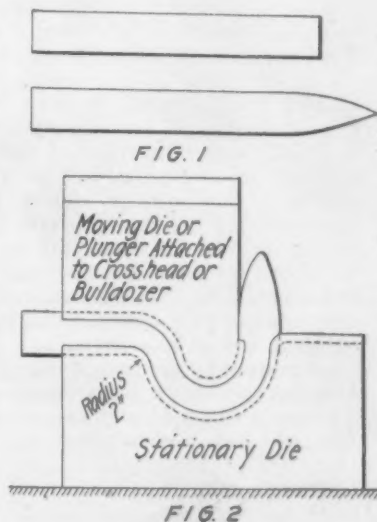
Bulldozer in Manufacture of Heavy Forgings

The use of a bulldozer as a preliminary machine in the manufacture of certain heavy forgings is illustrated by the 6-in. swivel tubing hook shown in the accompanying sketches. In this case production was facilitated and the expense of break-down hammer dies eliminated.

The steps in the manufacture of the hook may be clearly noted from the sketches. A billet 6 in. in diameter and 42 in. long, shown in Fig. 1, is subjected to a good forging heat after which one end is pointed in a hammer. The billet is then transferred to a two-stage die in a Williams, White & Co. No. 27 bulldozer, the first stroke of which forms a double bend in the billet as shown in Fig. 2. This operation is severe, as the radius of one bend is 2 in. and of the other 4 in., and often indicates a peak load of more than 75 hp. In the third operation the bent billet is transferred to the second stage of the bulldozer die, and another stroke of the machine completes the rough forming of the hook as shown in Fig. 3. The partly formed hook is then ready for drop forging. As very little heat is lost in the bulldozer operations, it is said to be unnecessary to heat the material for drop forging, which is an additional source of economy.

The hook is drop forged on a 3500-lb. board drop hammer to the approximate contour shown in Fig. 4. Following this is the fifth operation in which the stock

Operations Involved In Forging 6-In. Tubing Hook. Pointing of the billet is shown in Fig. 1, and the bulldozer operations in Figs. 2 and 3. In the fourth operation, Fig. 4, the hook is drop forged and in the fifth operation the toggle end is reheated and drop forged as shown in Fig. 5. The assembly of crosshead, bushing and cap to toggle of hook is shown in Fig. 6

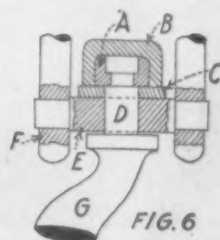


Wages of Sheet and Tin Mill Workers Reduced 3 Per Cent

Tonnage rates paid sheet and tin mill workers in mid-Western mills subscribing to the sliding scale wage agreement of the Amalgamated Association of Iron, Steel and Tin Workers decline three per cent of the base rate for the July-August period, following the bi-monthly settlement July 11 at Youngstown. Examination of sales sheets disclosed an average selling price for the 60-day period ending June 30 of \$3.60 per 100 lb. for Nos. 26, 27 and 28 gage black sheets, as compared with \$3.70 two months before.

Under the new rate affected workers will be paid 43½ per cent above base. This rate compares with a postwar peak rate of 109 per cent above base, reached in 1920.

The examination indicated that independent sheet makers are closely adhering to current quotations,



is heated on one end and the toggle connection is forged as shown in Fig. 5. The complete hook is then assembled as shown in Fig. 6, the assembly consisting of the following parts: A, split bushing in two halves interlocking in toggle of the hook; B, cap; C, wear ring; D, hook toggle; E, crosshead; F, shackle; and G, hook. The cap, B, is drop forged of open-hearth steel and is then drawn over the interlocking bushings. This operation is done hot, the cap being heated, and the capping is done on the bulldozer employed for second and third operations. This is considered a novel operation.

In the bending operations shown in Figs. 2 and 3 the grain of the metal is preserved and a strong product assured. Hooks manufactured by the process described and subjected to tests are said to have only partly straightened under a load of 456,000 lb. A slight deformation was noted in the crosshead and shackle but the cap was unaffected. The weight of the finished hook alone is 330 lb. and the weight of the hook assembly complete is 550 lb.

In THE IRON AGE of last week, Commissioner Thompson of the Shipping Board was inadvertently quoted as saying that "Congress has been willing to do nothing to meet the wishes and suggestions of the board." This reverses the meaning of what Mr. Thompson said. The word "nothing" should have read "anything."

averaging 3.55c. per lb. for No. 26 gage, 3.60c. for No. 27 and 3.65c. for No. 28, the base.

Shipments for the period covered by the examination showed a decline as compared with the preceding two months. It is apparent there have been no sharp deviations by mid-West sheet makers from established price levels.

This is the second wage reduction in 1924 for sheet and tin mill workers. Previous to the May settlement, based on a 3.70c. card, the average selling price as revealed by the bi-monthly examinations had been 3.75c. per lb., since November, 1923.

The Burden Iron Co., Troy, N. Y., is disposing of a preferred stock issue of \$700,000, the majority of the proceeds to be used for the purchase of a substantial interest in the Hudson Valley Coke & Products Corporation of the same city. Plans are being arranged by the last named organization for the construction of a large central gas-generating plant and system in the vicinity of Troy, to furnish public utility companies operating in that section, as well as at Albany and Schenectady. The project will involve in excess of \$1,000,000. The Adirondack Power & Light Corporation, Schenectady, is understood to be interested in the new plant.

Sensitive Clutch Control Device for Northwest Cranes and Shovels

A device known as the feather-touch lever control, and intended to facilitate shifting of the clutches, is a feature recently added to the cranes, draglines, shovels and trench pull shovels of the Northwest Engineering Co., 28 East Jackson Boulevard, Chicago. The device is said to provide fineness of control without muscular exertion, permitting the operator to "feel" his way and handle the work accurately. It is also claimed to eliminate the cost and overcome the disadvantages of steam and air rams.

The device is applied to the end of the drum shaft



Feather-Touch Lever Control Device Intended to Facilitate Shifting of Clutches on Cranes and Shovels

and actuates the clutch shifter rod which is concentric with the drum shaft and contained in a drilled hole within it. The clutch shifter rod moves back and forth, the inner position being the engagement and the outer position the disengagement. A small drum is keyed on the drum shaft and rotates in the same direction; a clutch band is wrapped about this drum and co-acts with it.

The operation of the device is said to be based on the law that there is a definite ratio between the two ends of a clutch or brake band, which is wrapped externally to a moving drum, depending on the arc of contact and the coefficient of friction of the brake lining to the co-acting surface. Thus, it is said, if the ratio has a value somewhere between 3 and 5, and 100-lb. pressure is applied to the end of the band toward which the drum rotates, by means of the control lever and intermediate linkage, and the opposite end of the band is used to throw the clutch, the effort necessary will be reduced from 1/3 to 1/5 of that necessary to throw the clutch by hand. Disengagement of the clutch is positive. The action of the lever opposite to that necessary to engage the clutch releases it. A lug is brought into contact with an adjusting screw imparting a reverse action to the entire mechanism.

The machine shop practice division of the American Society of Mechanical Engineers is sponsoring the program for three sessions at the forty-fifth annual meeting of the society, to be held in New York the first week in December. One of these sessions will have to do with lubrication and the second with cutting and forming of metals.

Steel Corporation's Orders Decrease

Unfilled business on the books of the United States Steel Corporation as of June 30 last, aggregated 3,262,505 tons, or 365,584 tons less than at the close of the previous month. In May unfilled business decreased 380,358 tons, in April 574,360 tons, in March 130,094 tons, while in February it increased 114,472 tons and in January 353,090 tons. A year ago the unfilled business amounted to 6,386,261 tons, or 3,123,756 tons more than today.

Following is the unfilled tonnage as reported by months since January, 1922:

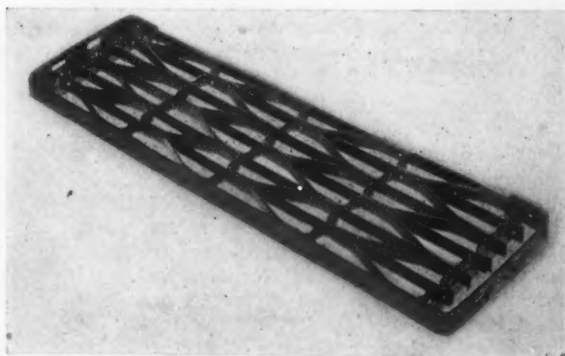
	1924	1923	1922
Jan. 31.....	4,798,429	6,910,776	4,241,678
Feb. 29.....	4,912,901	7,283,989	4,141,069
March 31.....	4,782,807	7,403,332	4,494,148
April 30.....	4,208,447	7,288,509	5,096,913
May 31.....	3,628,089	6,981,351	5,254,228
June 30.....	3,262,505	6,386,261	5,635,531
July 31.....	.....	5,910,763	5,776,161
Aug. 31.....	.....	5,414,663	5,950,105
Sept. 30.....	.....	5,035,750	6,691,607
Oct. 31.....	.....	4,672,825	6,902,287
Nov. 30.....	.....	4,368,584	6,840,242
Dec. 31.....	.....	4,445,339	6,745,703

Light-Weight Industrial Grating

Floor grating of light weight, designed for heavy loads by providing deep side bars, has been developed by the Arrowhead Iron Works, 200 West Fifth Street, Kansas City, Mo.

Type H grating consists of two comparatively heavy steel bars, disposed on edge, notched to fit the bearing, and connected by two or more crossbars riveted at contact points, to which is riveted a web of grating, $\frac{3}{4}$ in. deep, the span of which, from crossbar to crossbar, is always less than 2 ft. Owing to the notch at the bearing, no clips are necessary for fastening to channels or beams. It is necessary only to lay the grating in place. Outer bars are of sufficient depth to carry the load on any span without varying the depth of grating at the bearings, thus to insure a floor of uniform strength. When necessary the notch at the bearing can be made of such depth as will take care of any variations in levels of supporting steel without the use of fillers. Where the cut-outs occur, reinforcing angles are supplied with special roundhead bolts to fasten to adjacent heavy outer bars.

Arrowhead stair treads, one of which is shown here, are designed with a heavy continuous nosing bar which is riveted to a $3\frac{3}{4}$ -in. web supported by two carrier bars. The light web used reduces to a minimum the weight



Light-Weight Floor Grating Designed for Heavy Loads

on the stringers. The grating recently was installed at the Cahokia station of the Union Electric Light & Power Co., St. Louis, for which McClellan & Junkersfeld are the engineers. Fabrication is under way for a second unit which will require as much as the first.

A contract has been let to the Romell Motion Picture Co. to take 5000 ft. of film at the plant of the Quickwork Co., manufacturer of plate and sheet metal working machinery, St. Marys, Ohio, showing its line of rotary shears and attachments for circular and straight slitting work. Films will be used not only here but abroad as well, to develop markets in Japan and Europe.

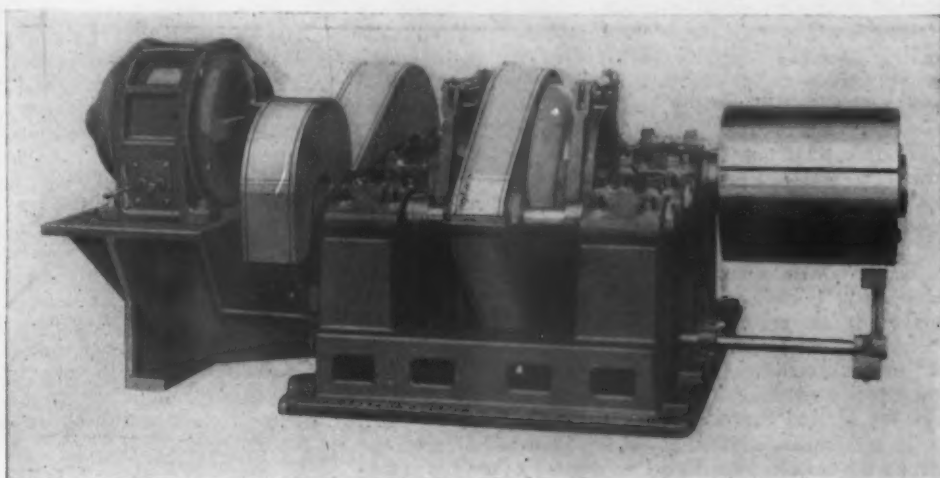
Strip Steel Coiling Machine

A new model of the Clark balanced tension reel for coiling strip steel from cold finishing mills, a feature of which is that it may be used with mills rolling at higher speeds than former types, has been brought out by the Duston & Clark Engineering Co., Cleveland. This reel follows the same general design of former models but has various improvements and refinements.

The reel is of heavy construction and is designed for rolling a wide range of strip stock. The same type of differential gearing is used as in earlier models. The bearings are built into a one-piece bed plate and are lined with heavy renewable self-oiling bronze journals capable of carrying high tension at high speed. The tension of the reel is adjustable from zero to the full power of the motor to meet the varying tension requirements depending on the width of stock, gage and temper.

A Clark bronze-faced automatic collapsing chuck 20

Balanced Tension Reel for Coiling Strip Steel From Cold Finishing Mills. The machine is similar to the company's former design, but may be used with mills rolling at higher speeds. The tension of the reel is adjustable up to the full power of the motor. The chuck is of the automatic collapsible type and is 20 in. in diameter and 22 in. face



in. diameter by 22 in. face which is built for quick release without scoring the stock during removal is part of the regular equipment. The chuck or take-up block functions automatically with the starting and stopping of the reel. It has three slots equally spaced to receive the stock so that one of these openings is handy to the operator when starting. After the coiling operation the chuck automatically collapses for the removal of the coil. It is claimed that the reel will wind the strip into a smooth, straight and tight coil and improve the product.

The bed plate of the reel is 45 in. wide and 64 in. long and the reel without its motor weighs approximately 7000 lb. The motor, which is mounted on the bed plate, has a capacity of 25 to 35 hp.

Drilling through a 3-in. billet of cast iron at the rate of 116 in. per min. is a record claimed to have been made by 1-in. and 1¼-in. Cle-Forge high speed drills of the Cleveland Twist Drill Co., Cleveland, at its demonstrations given during the exhibit held simultaneously with the convention of the American Railway Association at Atlantic City, June 11 to 18. The drills were operated at the rate of 800 r.p.m. and 0.145 in. feed. In machinery steel a 1-in. high-speed drill of the same brand, operating at 615 r.p.m. and 0.0815 in. feed is said to have drilled at the rate of 50 in. per min., and a 1¼-in. drill operating at 550 r.p.m. and 0.0815 in. feed, to have drilled at the rate of 44.8 in. per min.

A large car hearth annealing furnace will be installed at the plant of the Witherow Steel Co., Pittsburgh, by F. J. Ryan & Co., Philadelphia. The furnace is 34 ft. deep, 12 ft. wide and 6 ft. 6 in. high, capable of carrying a load of 75 tons on the car, and will be equipped with Ryan-Austin automatic temperature control.

No Increase in Shipbuilding in U. S.

The United States is one of the very few maritime countries that show no increase in the volume of shipbuilding orders, as compared with three months ago, says a statement just issued by Lloyd's Register of Shipping, covering the world returns for the quarter ended June 30. As a result, the statement adds, this country now ranks fifth among shipbuilding nations, not merely Great Britain and Ireland, but Germany, France and Italy also, constructing more tonnage than the United States, and Holland producing almost as much. German yards have under way about three and one-half times the amount of tonnage being constructed here. A year ago, American shipyards ranked sixth, and three months ago, fourth.

World shipbuilding in the aggregate shows a gain of 100,000 tons over the total at March 31 last. The share of Great Britain and Ireland in this increase is 43,000 gross tons, as compared with a loss of 16,000

tons for the United States, and a gain of 73,000 tons for all other countries combined. The comparison of orders now and at the end of March is shown in the following table, the figures representing gross tons:

	June 30	March 31
United States	103,665	119,767
Great Britain and Ireland...	1,516,746	1,473,629
Other Countries.....	996,486	923,108
World Total.....	2,616,897	2,516,504

New Jersey Zinc Company to Roll Standard Size Zinc Sheets

The New Jersey Zinc Co. is building a rolling mill at Palmerton, Pa., for rolling zinc sheets. For a number of years the company has been supplying the trade with strips rolled from zinc slabs. A large percentage of this production has been utilized by fabricators of spouting and gutters and in standing seam roofing.

The company now has gone in for making corrugated and plain zinc sheets, in standard sizes and gages, in addition to the narrower strips and ribbons. The executive offices of the company are at 160 Front Street, New York.

More than 300 coal and coke operators of western Pennsylvania and northern West Virginia are expected to attend the second annual dinner meeting of the Fayette Greene Coal Producers' Association at the Summit Hotel on Thursday evening, July 31. Walter Barnum, treasurer of the Pacific Coast Co., largest coal producing company on the Pacific Coast, and Harry Gandy, secretary of the National Coal Association, will be the speakers representing the coal industry. Elisha Lee, vice-president of the Pennsylvania Railroad, has accepted an invitation to make an address, and it is expected that C. W. Galloway, vice-president of the Baltimore & Ohio Railroad, also will address the operators.

LATEST METRIC MOVE

Advocates of the System Have Plan of Action for Meeting in Lima

WASHINGTON, July 15.—Renewed efforts are being made by the World Metric Standardization Council to get the Administration to support a plan for the adoption of the metric system by the United States. Defeated repeatedly by Congress, legislation to put the United States on a metric measurement basis is expected to be reintroduced at the request of its supporters at the next session, provided it can rally sufficient interest in it in the meantime. Apparently with this end in view, Secretary of Commerce Herbert Hoover has been asked to take the leading rôle in this activity and to participate prominently in the meeting of delegates from many countries of the Western Hemisphere which will meet in Lima, Peru, in November in a Pan-American commercial conference when another attempt will be made to induce the United States to adopt the metric system. Secretary Hoover, now absent from the city, is credited with having declared himself "in favor of the introduction of standards to be agreed upon by all commercial nations." The Secretary, however, is not quoted as favoring a metric system or any change by the United States from its present English system of measurement, and has in fact been said to be opposed to a change, though he has evidently avoided any specific recommendation. It is also notable that the Bureau of Standards, which in previous years was plainly in favor of adoption of the system, no longer is advocating it and is understood to be carefully avoiding going on record, because it does not consider it to be within its jurisdiction to suggest a change in the measurement policy practiced by the two greatest commercial entities in the world, the British Empire and the United States.

It is also a significant fact that, in addition to the strong opposition to the metric system taken by manufacturing interests of the countries, including machinery makers, the Chamber of Commerce of the United States as a body has refused to permit the taking of a referendum on the question by reason of lack of National interest and timeliness of the question. The National Council of the Chamber, at its meeting immediately preceding the recent convention of the Chamber in Cleveland, killed a proposal brought up by the Chamber of Commerce of San Francisco to take the question before the convention with a view to voting on the matter of submitting it to a referendum among members of the National Chamber. The National Council is made up of one member of each of the 1300 organizations of the chamber and acts in an advisory capacity to the Board of Directors of the chamber and voted down the recommendation of the San Francisco chamber to submit the question to a referendum. Also the board at its meeting here the first of the present month again refused to take up the question.

E. F. DuBrul, of the National Machine Tool Builders' Association, in opposing the metric system at the council meeting of the Chamber of Commerce of the United States in Cleveland, pointed out that the association has opposed the compulsory use of the metric system for a great many years and has no reason to change its opinion at this time. The metric system, he said, has been legal since 1866 and has not been able to win its way in this country on its merits up to this time, though it has had plenty of time.

"Now the difficulty with the compulsion of the use of the metric system, which is, after all, what the metric advocates are driving at, is to compel us to do something," said Mr. DuBrul. "Why should a few of us who cannot use the metric system in our business be licensed to use the old system? Why not license these people (those favoring it) to go ahead with their metric system if they wish?"

Mr. DuBrul explained that there are 110,000,000 people in this country who are used to the English

system and said that 10 years is not going to educate them to the metric system. This is the period of years proposed in bills before Congress after which the metric system would be made compulsory.

Something over a 100 years has not educated the people in some of the so-called metric countries, Mr. DuBrul said.

"What it has done," he stated, "is to give them dual and triple systems. We only have a single system now. It is easy enough to make calculations in those systems a little more facile by decimalizing some of our present units, but this building, as long as it stands, was built in inches, every gas pipe was threaded in inches, and as long as this building stands, somebody has to have the tools in inches to make repairs."

Japan Adopts Metric System

The metric system of measurement became official in Japan on July 1 of this year, according to a recent imperial ordinance, says a report to the Department of Commerce from Tokio. An ordinance puts into effect a law passed in 1921, providing for the use of the metric system, with a view of gradually displacing the complicated Japanese weights and measures. The Government for some time has been conducting an educational campaign, in order to popularize the system, and has staged demonstrations in various cities.

This law does not contemplate the immediate universal use of metric units, since it is realized that it will require considerable time to overcome the numerous difficulties. The great majority of the Japanese people understand only the native units and are very conservative and prone to stick to old customs and habits. Furthermore, there are very formidable, physical and financial difficulties to overcome. The replacement of the present scales used by the Imperial Government Railways, for example, will mean the purchase of several thousand new scales at an expenditure of possibly 1,000,000 yen.

Machinery Exports to Germany

WASHINGTON, July 15.—Exports of industrial machinery from the United States to Germany increased approximately 35 per cent, according to a statement issued by the Department of Commerce. In 1921 Germany stood thirty-first among the countries of the world as a market for American machinery. In 1922 it rose to twenty-fifth position, buying American machinery worth \$565,835. During 1923 purchases valued at \$763,553 placed Germany in twenty-third position among American markets for industrial machinery. In 1913 Germany absorbed American machinery amounting to \$5,259,454. In that year it stood in third position, ranking directly after Canada and the United Kingdom.

The plant of the Rivett Lathe & Grinder Corporation, Brighton district of Boston, Mass., will be closed from Aug. 16 to Sept. 2 for the annual vacation period. The office and shipping department will be kept open. Recently all departments have been running full time and the reopening in September will be on a full-time basis.

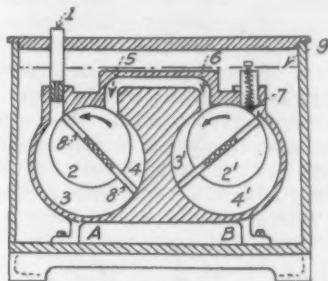
Automobile production in June showed a marked recession from May, according to *Automotive Industries*. The total number of cars and trucks produced during the month is placed at 265,000 compared with 312,813 in May, a figure that brings the aggregate output for the first six months slightly below that for the corresponding period a year ago.

A revised edition of a pamphlet on retailers expenses has just been issued by the domestic distribution department of the Chamber of Commerce of the United States, Mills Building, Washington. The first edition had a distribution of 60,000 copies.

Two-Stage High Vacuum Pump

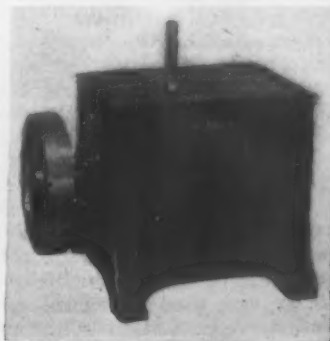
The two-stage high vacuum pump shown in the accompanying illustrations which has been placed on the market recently by the Eisler Engineering Co., 750 South Thirteenth Street, Newark, N. J., is intended for use in filling spirit levels, exhausting vacuum bottles, exhausting air for canning and preserving, removing gas from cupolas and for use in the manufacture of incandescent lamps, radio tubes, etc.

The arrangement of component elements of the



Two Stage High Vacuum Pump for Scientific and Industrial Use. The arrangement of parts is shown at left

The Machine Requires $\frac{1}{3}$ Hp. When Cold. It is claimed that a vacuum to 0.0001 mm. on the McLeod gage may be produced



pump may be noted from the diagrammatic view. In this view the two stages A and B are shown alongside of each other, although actually B is in front of A instead of at the right of it. The pumps rotate in the direction indicated by the arrows and have a common shaft. The connection to the object from which air is to be exhausted is shown at 1. The rotating pistons 2 and 2' are provided with sliding blades 8 and 8', which press against the walls of the cylinders as shown. As the pump rotates in the direction indicated by the arrows the volume of 3 and 3' increases while the volume of 4 and 4' decreases, the air being aspirated through opening 1, and in stage A is driven into communicating chamber 5. The stage B pump aspirates the air at 6, driving it out through valve 7 in a manner similar to that of stage A. Stage B exhausts itself through valve 7 in oil, the level of which is shown at 9.

The unit is operated at a speed of 375 r.p.m. The pumps are immersed in oil, the level of which should be a little above all the mechanical parts. The machine requires $\frac{1}{3}$ hp. when cold and a little less at 45 deg. C. It is claimed that this type of pump does not require any adjusting and will produce a vacuum to 0.0001 mm. on the McLeod gage. The weight of pump complete is 110 lb. and its general dimensions are 15 in. long, 8½ in. wide and 11½ in. high.

Indian Pig Iron in England

WASHINGTON, July 15.—Shipments of Indian pig iron to England are the source of comment in the *Indian Daily Mail* of Bombay of May 22. Vice-Consul Winfield H. Scott, Bombay, has sent to the Department of Commerce a copy of the report which states that a Middlesbrough firm of iron founders has imported a shipment of 100 tons of pig iron from India to be used in the manufacture of "chairs" for Indian railroads.

"That this product could be exported to England

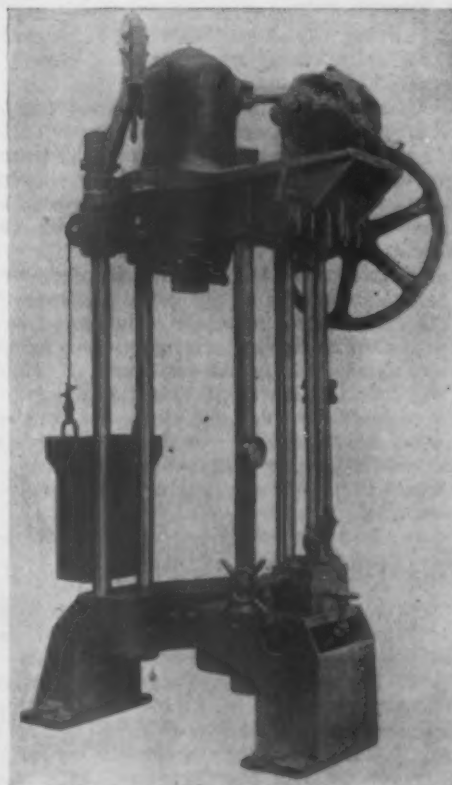
after the payment of the necessarily heavy freight and miscellaneous other charges at a lower rate than that prevailing for the same quality of ore in England is significant of the potential possibilities of the Indian iron industry," says the report.

"There are several existing factors which serve to interfere with a more rapid development of industrial activities in India, notably the inefficiency of native labor, although comparatively cheap, and the prevailing economic condition of the country, as a result of which prospective investors appear reluctant to advance large funds in new commercial enterprises."

New Hydraulic Bushing Press

The hydraulic bushing press illustrated, which is available in capacities ranging from 30 to 200 tons, for use in machine, railroad and other shops, is a recent addition to the line of the Southwark Foundry & Machine Co., 400 Washington Avenue, Philadelphia. Rapid action and the elimination of compressed air or other auxiliary apparatus are features.

The machine is entirely self-contained, and is made ready for its work merely by connecting the motor and filling the tank. Rapid movement of the ram is obtained by means of a triplex pump which has two high pressure and one low pressure plunger. In action the ram is brought rapidly down to the work by the large volume of water from the low pressure pump. As soon as the ram touches the work and pressure builds up in the cylinder the low pressure plunger cuts out automatically and discharges into the slack water tank, the pressure for doing the work being supplied by the high pressure plungers. After the operation is completed



Rapid Action and Self Contained Construction, Eliminating the Use of Auxiliary Equipment, Are Features

the ram is returned to its starting position by means of the counterbalance weight.

The press illustrated is of 100-ton capacity and is equipped with the standard work table at the bottom of the press. The table is available, however, in a variety of styles to suit special work. An overhead crane and trolley, arranged as shown, are supplied for work requiring a chain hoist.

Difference of Opinion as to Wear of "File Hard" Gages

Wide difference of opinion was expressed at the meeting of the Gage Steel Committee held in Detroit June 17, as to the desirability or necessity of having gages "file hard" in order to insure high resistance to wear. Discussion on this question followed the reading by H. Scott, Bureau of Standards, Washington, of a summary of the wear tests described in Communication No. 15 of the committee's tenth progress report.

G. Yates, C. E. Johansson, Inc., and J. B. Paloski, Ford Motor Co., Detroit, stated as their experience that "file hard" gages give a maximum of service. In the Ford plants only "file hard" gages are accepted for use under severe conditions. C. E. Watterson, president, Sheffield Machine & Tool Co., Dayton, Ohio; Maj. J. O. Johnson, Ordnance Department, Washington, and others expressed the belief, which was also based on experience, that gages of a composition which does not harden to file hardness showed higher resistance to wear than "file hard" gages. Major Johnson was speaking especially with reference to thread gages, however, and it was pointed out that conditions which hold true for plain gages may not necessarily hold true for thread gages. It was believed that the two types of gages should be considered separately.

Mr. Watterson reported that in a series of wear tests recently carried out by him drawn specimens of scleroscope hardness 60 to 70 showed wear of 0.0008 to 0.0013 in., while untempered specimens of 90 scleroscope hardness showed wear of about 0.0045 in. under the same conditions. His results on comparable steels agreed with the Bureau of Standards tests. The laboratory wear tests carried out at the Bureau of Standards were said to have tended also to show that tempering at 230 to 250 deg. C. does not decrease the wear resistance of plain steel gages. These laboratory tests should not, however, be regarded as conclusive. The question can be definitely settled only by a series of service tests under actual factory conditions.

H. W. Bearce, Bureau of Standards, Washington, and secretary of the committee, pointed out that the committee is now at a point where users of gages can render important and effective service by wearing out gages made to their own drawings, the gages to be furnished in series and each gage to be of known composition and heat treatment. The gages in each series will then be directly comparable, and the different series will also be made comparable by including a standard gage in each series. Several members volunteered to cooperate with the committee in carrying out service tests.

It was emphasized by the chairman, B. H. Blood, Pratt & Whitney Co., Hartford, that it is important that the gages selected for this work represent regular production jobs where gaging conditions are severe, in order that results may be obtained in a relatively short time, and also that they may apply where improvement is most essential.

New Trumbull Coke Plant Started

The new by-product coke plant of the Trumbull Steel Co., Warren, Ohio, was charged July 7 and the first coke was pushed the following day. The plant comprises 47 Koppers-Becker ovens and operation still is under the direction of the Koppers Co., Pittsburgh. It is operating on a coke time of 18 hr. The furnace of the Trumbull-Cliffs Furnace Co., jointly owned by the Trumbull Steel Co. and the Cleveland-Cliffs Iron Co., and serving the former with hot metal, will use the coke of the new plant. This stack, which had been down for relining for the past two months, has just been placed in operation.

An open competitive examination for associate mechanical engineer, to fill a vacancy in the office of the chief of air service, War Department, Washington, and vacancies in positions requiring similar qualifications, has been announced by the United States Civil Service Commission, Washington, and applications must be made before Aug. 19.

Buenos Aires Expects Extensive Building by American Company

An extensive building program is soon to be inaugurated in Buenos Aires by an American construction and development company, according to advices to the Department of Commerce from Commercial Attache Feely. It has been announced that this company has already signed a contract under which it is to furnish the city with sufficient funds to cover the expropriation of certain designated sections and that construction work under the supervision of the municipality will shortly be started. The total investment will be in the neighborhood of \$50,000,000, U. S. currency. It is expected that a large demand for building materials over a period of several years will follow, and that American prestige in Argentina will be greatly enhanced. The total cost of expropriating the land not already owned by the municipality is estimated at 32,815,000 paper pesos and the estimated total cost of the construction would be 97,129,000 pesos paper, the new buildings to cover a total of 32,157 square meters.

Gage Steel Committee to Meet in Boston

It has been tentatively decided to hold the next meeting of the gage steel committee in Boston during the fall meeting of the American Society for Steel Treating, Sept. 22 to 26. The committee has been invited by C. E. Watterson, president, Sheffield Machine & Tool Co., to meet in Dayton, Ohio, and it has been tentatively agreed to hold the first meeting after the September meeting in Dayton.

The Gage Steel Committee was organized in January, 1922, at the suggestion of the Ordnance Department of the U. S. Army. Its membership includes steel makers, gage makers and gage users. The object of the committee is to increase the life and improve the quality of limit gages used in connection with interchangeable manufacture, by a study of the relations between composition, heat-treatment, permanency of dimensions, and wearing quality of gage steels.

Absence of Depression in Sentiment

In its review of the pig iron market for the first week of July, the Matthew Addy Co., Cincinnati, calls attention to one conspicuous characteristic of the present halt in business—that there is abroad in the metal trades a far different feeling from that which was so generally prevalent in 1920 and 1921. The pessimism then so common is absent today. We quote:

"It is a notable and significant thing that this present depression in the iron trade is not marked by the hopelessness and apathy that was prevalent in 1920. On the contrary, everyone is more of less cheerful. All of our customers have expectations. Some of them are figuring on good contracts. Others have knowledge of business which they anticipate will presently come their way. Most of them are running at a fairly good rate. There has been no general stoppage of work as there was four years ago, and the course of real business this week has been distinctly favorable. Orders have been placed in large volume. In fact, as things are now going it seems almost unfair, or at least inaccurate to speak of the present depression. It would be better to speak of the late depression—although this would be somewhat anticipatory. The great trouble in the situation is because of prices. Iron masters are complaining they are too low. So do coke makers and coal miners. But while prices on raw materials are low, yet the one way to get business going again on a large scale is to make prices which will be so attractive as to be irresistible."

The Department of Interior last week announced the award of five war mineral claims amounting to \$25,657. They were: Spurgeon, Lunsford & Lunford, Bowie, Ariz., \$2,171.08; The Sawyer Tanning Co., Napa, Cal., \$1,411.62; A. S. Adams, Rocky Mount, Va., \$788.66; Pocahontas Manganese Corporation, Bluefield, W. Va., \$16,159.31.

PROPERTIES OF BRASS

What the User Takes Into Account in His Choice of Product

In a recent booklet entitled "How to Order Brass" the Chase Metal Works division of Chase Companies, Inc., Waterbury, Conn., presents details concerning the manufacture of the various alloys of brass and their uses in the form of sheets, wire, tubes and rods. The subject is treated with special reference to the proper alloy and temper to be chosen for the intended use, also to methods of testing and to the tolerances for the various forms of rolling mill product. From the introductory section the following is taken, dealing generally with brasses and their properties:

"There are hundreds of different alloys of brass, many different tempers and many classifications of tolerances. Each alloy and each temper determines certain properties in the brass, and every purchaser must decide what particular property is the most important for his use. For example: if he makes electric wire, electrical conductivity would be the most important factor for him to consider. If he is to make brass springs, elasticity should be considered first. For heating coils, thermal conductivity. In condenser tubes, resistance to corrosion. In brass for severe drawing, ductility.

"And so the purchaser must first decide what particular property is most important for him to have in his brass, for this necessary property will determine what alloy and temper of brass to order. The important characteristic properties of brass, physical, chemical, mechanical or electrical, are determined principally by the chemical composition of the brass alloy, and secondly by the mechanical or heat treatments given. These properties are determined sometimes by the alloy itself, in other cases by the alloy plus the additional mechanical or heat treatments, but the alloy is always of first importance.

"The properties of brasses may be divided into two general classes—physical and mechanical. The physical properties are determined almost entirely by the chemical composition (such as the amount of copper in the brass, the addition of tin or lead, etc.). Such properties are practically independent of the size or form of material and cannot be appreciably changed by any mechanical or heat treatment. Under this classification of physical properties the following are listed: Density, color, melting point, specific heat, coefficient of thermal expansion, electrical conductivity, thermal conductivity, resistance to corrosion.

"Some of these properties can be slightly changed by other treatments, but so slightly that for all practical purposes we may say that they are produced by the alloy alone. Other properties, while determined to a considerable extent by the chemical composition of the brass, can be varied within relatively wide limits by suitable mechanical or heat treatments and produce in the brass the following typical properties: Strength, hardness, elasticity, ductility, malleability.

"It is most important that the purchaser always keep these facts in mind, for the first thing to consider in ordering brass is to specify the brass alloy and the brass temper which will give him the property that will be most important for his uses.

"The alloy is the first consideration in ordering brass, and is often difficult to determine. There are literally hundreds of alloys under the general classifications of brass, bronze and nickel silver.* It is not surprising, therefore, that many errors are made in specifying the alloy.

"Brass is an alloy composed mainly of copper and zinc. The useful brasses always contain 55 per cent or more of copper. Other metals are found in brasses as impurities, or are added to give special properties. Lead and iron in particular are always present in brasses as impurities, often to the extent of 0.3 per cent and 0.2 per cent respectively. The metals usually

added in special brasses are lead, tin, iron, manganese, phosphorus or combinations of these. Lead is added to give cutting or machining properties. Iron is added to give strength and hardness. Tin is added to increase the resistance to corrosion, especially for marine work; manganese and phosphorus are added mainly as deoxidizers, usually only in small quantities. Brasses containing these metals are, or should be, called 'lead brasses,' 'tin brasses,' 'iron brasses,' etc.

"Bronze is any alloy of copper and tin containing over 50 per cent copper. The wrought bronzes, however, will contain at least 88 per cent copper. Frequently special brasses are wrongly called bronzes, but are generally known as such in the trade.

"Nickel silver is any alloy of copper, zinc and nickel. Although copper is invariably present in the largest amount, nickel is the most important element, and nickel silvers are generally classified according to the nickel content. Various alloys are commonly made containing from 55 to 70 per cent copper, 5 to 30 per cent nickel, and from 15 to 40 per cent zinc."

Heavy Exports of Automobiles

Increases in the number of passenger cars and motor trucks exported and in the number of American cars assembled abroad were the salient features of the automotive export situation during May, although the total value of automotive products exported was almost \$2,000,000 below the figure for April, says the Automotive Division of the Department of Commerce. May values amounted to \$20,966,227, as compared with \$22,829,150 in April, \$21,226,273 in March, \$19,566,226 in February, and \$18,465,202 in January.

The phenomenal extent of automotive shipments from the United States so far this year is measured by the fact that during the first five months their aggregate value has reached \$103,053,078, or about 57.7 per cent of the total value for the entire year 1923.

Mechanical Refrigeration

Safe Practice Pamphlet No. 61, recently published by the National Safety Council, is entitled "Mechanical Refrigeration."

"Mechanical refrigeration has become indispensable to many industries and is frequently used in homes, but, like other kinds of equipment, has proved to be dangerous to life and limb and health at times," the council's engineers say in introduction. "The purpose of this pamphlet is to outline the properties of refrigerating materials and types of equipment used, to discuss the hazards involved, and to describe methods for overcoming or lessening them."

This safe practice pamphlet, according to the National Safety Council is in no way a duplication of the proposed mechanical refrigeration safety code, sponsored by the American Society of Refrigerating Engineers, but is simply designed to present information that will be helpful to industries and the general public in avoiding accident and health hazards.

The testing of the power of horses seems to be the vogue since a tractive dynamometer was employed some time ago under the direction of the College of Agriculture at Ames, Iowa, reported at the time in these columns. Then a team was found to have a pulling power of 2300 lb. This was beaten by teams at the national horse show in New York, which registered a tractive power of 2400 lb. and this record has been broken successively until a team at Calgary, Alberta, has been found capable of pulling 2600 lb., which may be translated as equivalent to starting a load at 33,760 lb. on granite block paving, but with this important difference—that the expenditure of energy was continued for a distance of 27½ ft., whereas after starting a load the force required to maintain the pull drops to a small fraction of the original effort to overcome the inertia of rest.

*Prof. W. Campbell lists about 1500 non-ferrous alloys of which nearly 700 fall under the classes mentioned. See Proceedings A. S. T. M., vol. 22, part 1, pages 213-242.

TARIFF BILL STIRS VIENNA

Austrian Iron and Steel Market Unsatisfactory, Though Production Holds Up

BERLIN, GERMANY, June 26.—The duties on metals in the new tariff bill now before the Vienna Diet are being bitterly opposed. The socialists support the attack upon the proposed pig iron and steel duties which was begun by the consuming manufacturers. The iron producers claim that the proposed rates are not adequately high. They demand an import duty of 1 gold crown per double-centner (100 kg.) on pig iron, 2 crowns on semi-finished material, 4 crowns on bars and 5 crowns on thick sheets.

Ad valorem, they complain, the new duties will be only a fraction of those of before the war. The pre-war duty on bars worked out at about 33 per cent; the present officially proposed duty is 14.75 per cent. The producers demand 19.75 per cent. The existing duties on bars in Hungary, Czecho-Slovakia, Poland and Jugoslavia are all, it is claimed, higher than 20 per cent ad valorem. The manufacturing consumers object that Austria is obliged to export about 80 per cent of her machinery output; and that therefore raw and semi-finished materials must be kept as cheap as possible.

Unsatisfactory Trade in Iron and Steel

The condition of the iron and steel trade is unfavorable. Firms short of money throw their wares on the market at very low prices. Present dealers' prices are, per kilogram: bars, 4025 paper crowns; thick sheets, 4650 crowns; wire, 4500 crowns. To prevent price cutting the six chief Vienna dealers propose to create a selling syndicate which will be connected with the Austrian iron cartel, created by the producers last spring. This cartel, the aim of which is to ration output and allocate orders, was formed by the Alpine Montan-Gesellschaft and seven other firms, including Felten und Guilleaume, Schöller-Bleckmann and the Fischer Steelworks Co. The Böhlerwerke A.G. remained outside the cartel. The agreement holds goods until 1927.

Winners of Memorial Scholarships

Homer C. Porter, Pittsburgh, Robert W. Richards, Pittsburgh, Robert E. Patterson, Wilkinsburg, Pa., and Samuel D. Reynolds, Rutledge, Pa., were the winners of the war memorial scholarships annually awarded by the Westinghouse Electric & Mfg. Co. They are either employees or sons of employees of the company. The scholarships, established as a memorial to Westinghouse employees who entered the service in the World War, carry an annual payment of \$500 for a period not to exceed four years, such payment to be applied to an engineering education in any technical school or college that the successful candidate may select with the approval of the committee. The scholarships are granted for one year only, but will be continued for the full course provided the scholar maintains the academic and other standards required by the college or institution in which he elects to pursue his course of study.

Data on Structural Material

Values of the strength of pure metals and their alloys and of wood are given in the revised edition of the Bureau of Standards circular on the physical properties of materials. The data include the strength in tension, compression and in shear, the resistance to fatigue, and many other properties which an engineer must know in order to design a structure that will safely carry its intended load. The effect of high temperatures on the strengths of different metals is shown by tables and by graphs, and the physical properties such as specific gravity, melting point and coefficient of expansion are given.

The information given is compiled from various sources, including tests made at the Bureau of Standards. The data on wood are taken from Bulletin 556 of the United States Forest Service, Department of Agri-

Austrian machine builders complain of increasing German competition. Orders for general machines and for machine tools have fallen off. Conditions in the agricultural machinery and electrical branches are fairly good. Export of heavy iron and steel to Germany, which was active in 1923, has almost entirely stopped.

Better Production Volume

Production, with the exception of iron ore, has of late increased. In the first quarter of 1924 were mined 841,162 metric tons of coal, against 784,655 tons in the last quarter of 1923; and 216,144 tons of ore, against 302,195 tons. Pig iron production was 107,899 tons, against 76,733 tons; raw steel production, 140,922 tons, against 133,599 tons. Production of bar iron in the first quarter of 1924 was 43,086 tons, against 38,708 tons in the last quarter of 1923; steel rails, 8992 tons, against 9575 tons; sheets, 10,719 tons, against 10,085 tons; wire, 17,442 tons, against 19,300 tons.

Last reported producers' prices are (in paper crowns per metric ton): pig iron, 1,900,000; bars, 3,050,000; thick sheets, 3,225,000; wire, 2,850,000. Present average wages in the pig iron industry are 64,000 paper crowns per 8 hr. shift; in the steel industry, 70,075 crowns.

For the first quarter of 1924 the foreign trade report shows a passive balance of 267,459,000 gold crowns, against 141,000,000 crowns for the first quarter of 1923. Both import and export of most kinds of machinery show a decline. The leading Alpine Montan-Gesellschaft, which is semi-fused with the Stinnes Rhine-Elbe Union, reports for 1923 net profits of 28,058 million paper crowns, against 4870 million crowns in 1922, and declares a dividend of 8000 crowns per share, against 4000 crowns for 1922. The company's pig iron production in 1923 was 340,000 tons, against 316,000 tons in 1922; ingots, 322,000 tons, against 297,000 tons; rolled goods, 198,000 tons, against 200,000 tons. Camillo Castiglioni has been elected president of the directors' council, in place of the late Hugo Stinnes. The Stinnes interest will be represented by Dr. Albert Vögler.

culture. Most of this material has been available before, but in such a scattered form that considerable searching might be required to secure necessary information. The first edition was issued in 1921. The present edition contains a large amount of new material, much of which has been published since that time.

These data are given in circular 101 of the Bureau of Standards, Department of Commerce, entitled "Physical Properties of Materials." Copies may be obtained from the Superintendent of Documents, Government Printing Office, Washington, at 40 cents a copy.

Summer Conference for Engineering Teachers

PITTSBURGH, July 15.—Thirteen professors and instructors of various universities and colleges are now attending the fourteenth annual session of the Summer Conference for Engineering Teachers, which began July 7 at the works of the Westinghouse Electric & Mfg. Co., and runs until July 31. The program for the conference is worked out so that each member is afforded an opportunity to carry on some lines of engineering work. Inspection trips are conducted through the plant so that the members may become acquainted with the different kinds of work which the technical graduates are doing. Conferences are also being arranged with prominent engineers and executives of the Westinghouse company who are charged with the planning and the carrying out of various projects. A similar conference is being conducted at the South Philadelphia plant of the Westinghouse company, under the direction of R. P. Carey, supervisor of education at that plant. Six professors and instructors are attending this conference, and some of the members of this group will join the East Pittsburgh conference later in the season.

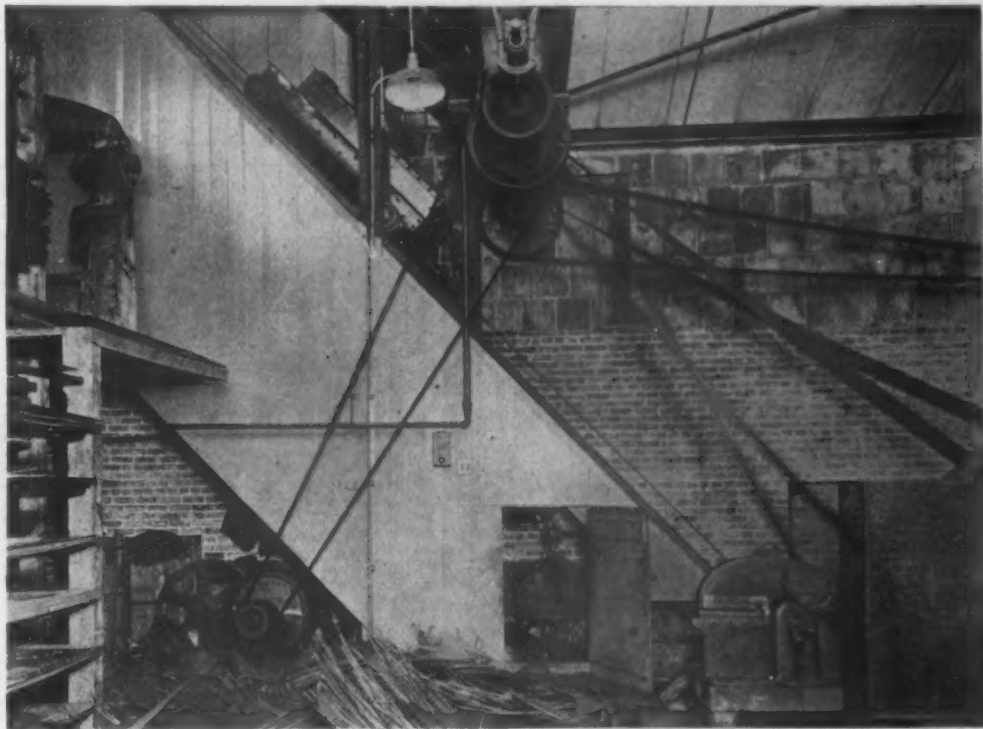
Lifting Magnet for Scrap Skip Hoist

An unusual use of the lifting magnet has been made in the plant of the Harrington & King Perforating Co., Chicago. It is a skip-hoist on which the skip has been replaced by a magnet for carrying metal punchings and other steel scrap to a hopper for loading on railroad cars.

The steel scrap as it accumulates is carried to a 400 ton storage bin below the floor level at one end of the main building. To load the scrap from this bin into gondola cars which are spotted just outside of the building, the hoist as shown in the illustration was built.

A No. 3 magnet made by the Electric Controller & Mfg. Co., Cleveland, is suspended from a 45 deg. track which runs from the hopper below the scrap bin to a chute which has a spout dropping over the gondola car.

Scrap Steel at the Foot of the Skip Hoist Is Lifted By Electric Magnet to a Hopper Over a Railroad Car. The counterbalance to the magnet is shown on the inclined rails over the hoistway



To cut down the power necessary to operate this system, the magnet is balanced by a counterweight which moves in a direction opposite to that of the magnet. The driving is done through a friction drum driven from a 10 hp. E. C. & M. motor.

When the magnet is in its lower position where it is resting on the scrap in the hopper, the magnetizing current is turned on and it picks up a load of scrap. Then the operator runs the magnet up to the loading chute where the magnetizing current is shut off and the load is dropped. Eventually this company intends to make this process automatic so that the magnet will run up and down, picking up and dropping a load each time without the direction of an operator.

By this arrangement the company, it is stated, can load 20 tons of scrap an hour. On the basis of a capacity to lift 650 lb., the magnet would handle in 60 round trips the 40,000 lb. A saving is obtained by the ease of delivery to the car against storing in the plant yards and loading as necessary.

The Pittsburgh Piping & Equipment Co., Thirty-fifth and Charlotte Streets, Pittsburgh, has acquired from the Worthington Pump & Machinery Corporation, the old Epping-Carpenter Pump Co. plant, Forty-third Street, Pittsburgh. G. H. Danner, president, is not yet ready to announce plans of the company with regard to the newly acquired plant.

Traffic Through United States Ports

WASHINGTON, July 15.—The Bureau of Research, United States Shipping Board, has just completed a comprehensive survey of the water-borne traffic conducted through United States ports during the calendar year 1923. It shows the distribution among ports under the American flag of nearly 126,000,000 tons of freight handled during the year. More than 55 per cent of this total passed through six ports, each of which is credited with a movement of over 5,000,000 tons. New York led with a total of 27,600,000 tons, and was followed by Los Angeles, with 11,490,000 tons; Baltimore with 8,300,000 tons; New Orleans with 8,290,000 tons; Philadelphia, with 7,870,000 tons, and San Francisco with 5,740,000 tons. Of the total of 126,000,000 tons, 92,000,000 tons, or 73 per cent, represented trade with

foreign countries, 25,000,000 tons the traffic handled by Pacific ports and Atlantic and Gulf ports in intercoastal trade, and 9,000,000 tons, the volume of cargoes passing through continental and non-contiguous territory ports in the non-contiguous United States territory trade.

Announcement was made last week that the Geological Survey has begun its twenty-sixth successive year of the investigation of the mineral resources of Alaska. A detailed topographic survey is being made of the Hyder district, of southeastern Alaska, by R. M. Wilson, topographic engineer. A. F. Buddington, geologist, is continuing his investigation of the geology and mineral resources of southeastern Alaska. This year he will investigate parts of the Ketchikan, Wrangell and Juneau district. F. H. Moffit is studying the geology and copper resources of Prince William Sound, while S. R. Capps, assisted by Kenneth Landes, is making a supplementary examination of the Matanuska coal field.

The Interstate Commerce Commission has suspended from July 10 until Nov. 7 railroad schedules proposing to reduce the rates on tin, terne and black plate, carloads, from Pittsburgh and other producing territories to Houston, Tex., and group points without corresponding reductions to intermediate points in Texas common point territory. The proposed reduction of 14c. per 100 lb. on the Pittsburgh-Houston rate is illustrative.

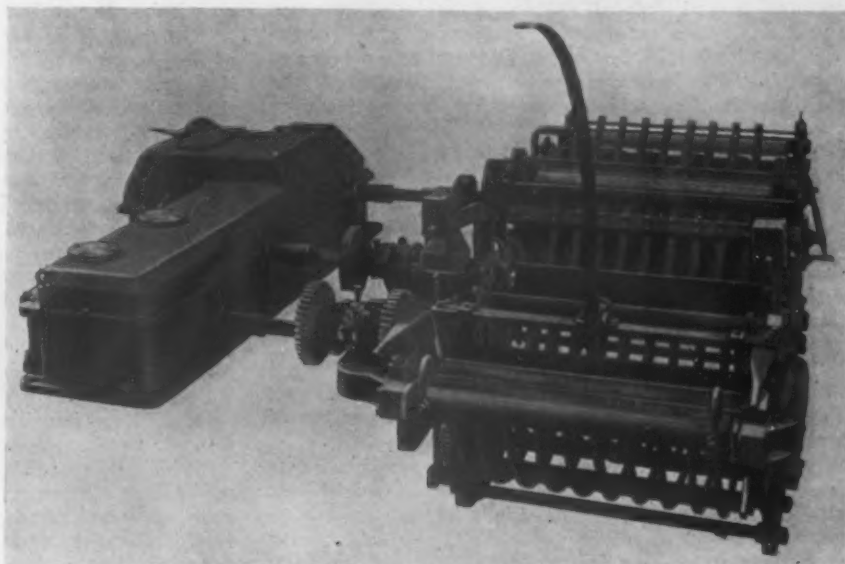
New Sheet-Galvanizing Machine

A new galvanizing machine, one of the features of which is the improvement of the housing design for the bottom rolls, has been placed on the market by the United Engineering & Foundry Co., Pittsburgh.

The drive unit, which is shown at the left in the accompanying illustration, is self-contained and is entirely inclosed. It is connected to the machine by spindles and coupling boxes as shown, an arrangement intended to provide an easy means for disconnecting when

scleroscope. The spindles are claimed to have a low coefficient of friction and excellent wearing qualities, running in hard bronze bearings without danger of grooving. The drive is through four integral keys. The patented spindle nose is intended to provide a hardened bearing for a chuck or face plate on both sides of the thread, giving a maximum value of torque, a shoulder of ample area and maximum length for maintenance of correct and rigid position. The threads are a little flat on the inside diameter of plates and a free fit over the outer nose, which permits these members to be slipped

Self-Contained Drive, Entirely Inclosed and Separate From the Pot, and Also Improvement of the Housing Design for the Bottom Rolls Are Features. A clutch is provided for disengaging the entering rolls from the drive



the machine is lifted out. Splash lubrication is provided for all gears and bearings in the drive unit. Change gears with a 4 to 1 ratio together with an adjustable speed motor give a speed range of 14 to 1. Additional speed adjustment is provided for the exit rolls.

The frame, which is of cast steel, is of simple but rigid construction, and rests on top of the pot entirely free of the bath. The housing for the bottom rolls is made of a single slab of rectangular section and is attached to the frame above the bath. A feature of this housing is that the usual construction employing a gusset plate and rivets has been eliminated. The bottom rolls are driven through a worm in the bath and inclosed bevel gears on top of the frame of the machine.

A clutch for engaging and disengaging the drive unit from the entering rolls is an operating convenience emphasized. The front and back guides for the bottom rolls may be removed without removing the machine from the pot. Guides to suit the weight of the sheets to be handled are available.

Improves Spindle for Lathes

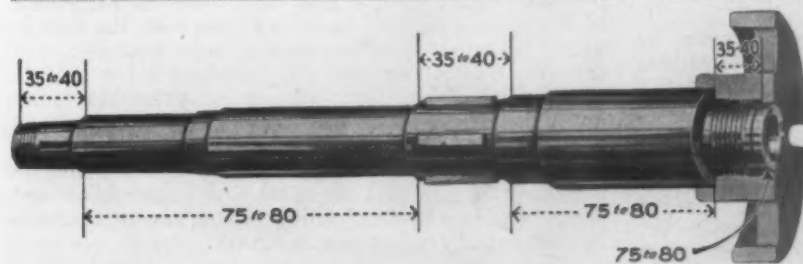
A hardened spindle with patented spindle nose has been added as a feature of the geared-head lathes of

over the outer nose, thus piloting them on to the threads. Because several threads are engaged before the mating portions are brought into contact, very close fits are said to be permitted. The hardened nose is intended also to prevent marring or bruising.

Steel Companies Entitled to Switching Charge Refund

WASHINGTON, July 16.—In a decision announced last Friday, the Interstate Commerce Commission held that the Monongahela Connecting Railroad Co., subsidiary of the Jones & Laughlin Steel Corporation; the South Buffalo Railway Co., subsidiary of the Bethlehem Steel Corporation; the Union Railroad Co., and the Newburgh & South Shore Railway Co., Steel Corporation subsidiaries, are common carriers and are entitled to receive from their trunk line connections divisions of joint rates or absorptions of switching charges.

The case was instituted by the Jones & Laughlin Steel Co. (now corporation), which, with other steel companies, was awarded reparation because of additional freight charges imposed by reason of the fact that these individual lines had been treated as plant facilities rather than as common carriers during the period from April 1, 1914, to April 14, 1915. Unof-



Hardened Spindle With Patented Nose Has Been Provided for the Geared-Head Lathes. The numbers on the spindle indicate the hardness as determined by the scleroscope

the Lehmann Machine Co., St. Louis. The lathes are available in five sizes from 16/18 1/4 in. to 24/27 1/4 in.

In the accompanying illustration of the spindle the numbers indicate the hardness as determined by the

specially, it has been estimated that the total reparation will approximate \$2,000,000, but the commission said the exact amount could not be determined upon the record and has asked for additional data.

NATIONAL STORAGE OF COAL

Report of 400 Engineers Who Carried on Survey for More Than a Year

The storage of coal is essentially necessary as an aid to the solution of the national coal problem, "and is an economic and practicable means of insuring an adequate supply of coal as needed," according to a report of the storage of coal committee of the American Engineering Council. The committee worked with the Department of Commerce, the United States Coal Commission, and Federal, State and municipal agencies as well as private enterprise. Sixty-seven sub-committees, functioning in important industrial centers and comprising 400 individual engineers, constituted the field organization, which carried on the nation-wide survey for more than a year.

"For seasonal storage, from 9 to 10 per cent of the annual consumption is all that is required," says the report. "If this amount is supplemented by additional reserve storage of no more than 7 per cent, there will result an accumulation of some 83,000,000 tons of coal in storage by Sept. 30 of each year. The practicability of this amount of storage with but slight additional outlay for equipment is indicated by the fact that in September, 1923, 56,000,000 tons were in storage.

"Equipment has been developed and may be secured to meet any storage situation or requirement. The cost of such equipment ranges from a few cents per ton of capacity up to \$2.50 or \$3 per ton of capacity.

"Storage of coal presents no serious risk of loss from breakage, spontaneous combustion, or loss of heat value or firing qualities. All kinds of coal have been and may be successfully stored. The insignificant money loss due to the factors named above should not deter any one from storing coal. Application of the simple and inexpensive regulations and practices set forth in this report will provide all reasonable safeguards against such possible losses.

"The cost of storage per ton, including fixed charges on equipment, maintenance and operation expense and interest on investment in coal as well as taxes and insurance, in most instances does not exceed 75 cents per ton yearly. More generally it is around

50 cents per ton yearly. This cost is insignificant when distributed over annual consumption. Storage of coal may be easily financed. Banks will finance such an investment as readily as any other commercial undertaking.

"The railroads have more to gain by storing coal than any other class of consumer. They should store their own coal on such a scale and at such times as to obviate the movement of company or non-revenue producing coal during the period when there is a heavy demand for the transportation of revenue producing freight. They should abandon, however, the uneconomic practice of using freight cars for storing coal and thereby withholding railroad equipment from other uses.

"In general, storage should take place at the point of use, to accomplish the most in relieving transportation and safeguarding supply. However, under some circumstances, storage-in-transit or at an intermediate point is advisable. In general, storage at mines is not recommended, but there should be sufficient mine storage facilities and capacity to overcome ordinary operating delays, such as belated arrival of cars, temporary breakdown or idleness of mining equipment and the like. Such provisions would materially increase the producing hours of mines and miners.

"Cars should be assigned to mines upon the basis of coal actually sold and not upon rated capacity of production. This measure would be a wholesome deterrent to over-development of coal producing facilities."

The personnel of the committee of the American Engineering Council which conducted the investigation follows:

W. L. Abbott, chief operating engineer of the Commonwealth Edison Co., Chicago, chairman; H. Foster Bain, director Bureau of Mines, Washington; William Hutton Blauvelt, consulting engineer, New York; W. H. Hoyt, chief engineer Duluth, Missabe & Northern Railway Co., Duluth, Minn.; William J. Jenkins, vice-president and general manager Consolidated Coal Co., St. Louis; David Moffat Myers, consulting engineer, New York; Prof. S. W. Parr, University of Illinois, Urbana; Dean Perley F. Walker, University of Kansas, Lawrence; Roy V. Wright, editor *Railway Age*, New York; Edgar S. Nethercut, secretary Western Society of Engineers, Chicago; O. P. Hood, U. S. Bureau of Mines, Washington.

Decline in Imports This Year

WASHINGTON, July 14.—A marked decline in imports of raw materials for use in manufacturing was the outstanding feature of American import trade for the first quarter of 1924, according to an analysis of the figures for that period just made public by the Foreign Commerce Department of the Chamber of Commerce of the United States. The analysis shows that textile imports, chiefly raw silk, wool and cotton, alone accounted for \$72,000,000 of the \$80,000,000 decline below last year's figures.

The most noticeable quantity declines are in coal and coke, 83 per cent; pig iron, 78 per cent; ferromanganese and other manganese alloys, 67 per cent.

Production of Portland Cement

Portland cement production in June is reported by the United States Geological Survey at 13,538,000 bbl., making 39,041,000 bbl. for the second quarter and 66,787,000 bbl. for the first half-year. Both these latter figures are new high records, comparing with 36,651,000 bbl. and 62,731,000 bbl. last year. Except for May, with 13,777,000 bbl., June furnished the highest monthly total ever recorded. The highest quarter previously reached was the third quarter of last year, with 38,696,000 bbl.

Shipments in June, at 15,036,000 bbl., were the highest of any month to date, exceeding May by 485,000 bbl. The previous high record was made last August, with 14,971,000 bbl. Stocks at end of June were 14,905,000 bbl., a drop of 3,284,000 bbl. from the year's high, at end of March.

Increased Exports of Manufactured Goods in Past Three Months

WASHINGTON, July 16.—An analysis of American export trade for the first three months of 1924 just completed by the Foreign Commerce Department of the Chamber of Commerce of the United States showed a substantial gain made by manufactured goods in general as compared with the same period last year. The analysis, which was made public today, brought out the fact that exports for the first quarter increased in nearly every major line, with the exception of the grains.

A statement issued today by the department states that "our textile exports increased 24 per cent in value; our lumber exports gained 28 per cent, despite the heavy domestic demand; our iron and steel exports were 39 per cent higher than a year ago; overseas shipments of American machinery were up 23 per cent; the vehicle group, led by automobiles, made a 38 per cent gain, and exports of petroleum products increased 2 per cent in value. Among our foodstuffs export values of fruits and nuts almost doubled last year's figures with a 94 per cent gain."

Exports of agricultural machinery and implements increased 57 per cent in value and automobiles and parts 54 per cent. Our leading export, raw cotton, was 36 per cent above last year's figures.

The Vollrath Co., manufacturer of enameled ware, Sheboygan, Wis., has announced that it has no connection with the proposed merger of enameling companies recently reported in the press.

LIQUID-OXYGEN EXPLOSIVES

Demonstration of Power Given in a Blast in a Pennsylvania Quarry

On April 11, a demonstration of blasting was done with L. O. X., or liquid-oxygen explosive, at Myerstown, Lebanon County, Pa., on the property of the Calcite Quarry Co. It was carried out by officials of the Air Reduction Co. and the Ingersoll-Rand Co., who had had to do not only with the designing and the construction of the plant which furnished the liquid oxygen but who also worked out the details for the application of L. O. X. to the blasting of churn-drill holes.

The object of the demonstration was to conduct a complete blast in accordance with the usual procedure followed by the Calcite Quarry Co. in its routine operations. This took the form of a 12-hole blast on a 30-ft. bench which was located at one end of the quarry. The drill holes were spaced about 12 ft. apart and each of

in the evening of April 7, the net weight of the oxygen in the bottles amounted to 1541 lb., according to F. W. O'Neil, chief engineer Ingersoll Rand Co. When containers reached their destination in forenoon of April 11, they held a total of 1014 lb. of liquid oxygen, representing a loss of 527 lb. or 34 per cent. during a transportation period of 88 hr. In other words, there was sustained by evaporation a loss of 9.3 per cent each 24 hr.

When the soaking of the cartridges was begun there was available, therefore, 1014 lb. of liquid oxygen. Sixty-one cartridges were soaked although but 60 of them were actually utilized for the blast. When the soaking of the entire lot was completed there remained unused 93 lb. of liquid oxygen, that is to say, each cartridge absorbed substantially 15 lb. of the fluid, and the whole lot required 921 lb. for their saturation. The theoretical weight of oxygen needed for 61 cartridges, based upon the 2.66 ratio per unit of carbon, is 525 lb.; and, therefore, the oxygen factor in this demonstration was 1.75. As can be seen, an excess of 75 per cent



The Soaking Tank, Some of the Cartridges, and a Number of Insulated Transportation Bottles in Which the Liquid Oxygen Was Delivered from a Distant Plant

these holes was 28 ft. deep and $5\frac{1}{2}$ in. in diameter. The cartridges were 5 in. in diameter and 18 in. long, five of them being placed in each hole. For stemming, loose loam was poured into the holes, and none of this material was tamped.

The cartridge cases or bags were made of stout muslin and filled with finely divided carbonaceous material which was of a highly absorbent nature. Before soaking in the liquid oxygen, each dry cartridge, in its complete form, weighed 3.25 lb., the entire lot of 60 cartridges used in the blast weighing in this state 195 lb. As has been determined, each unit of carbon requires for its complete combustion to CO, a total of 2.66 units of oxygen. However, the ratio of absorption in the case of the cartridges employed at Myerstown was 3.5 units of oxygen—the excess oxygen allowing a correspondingly longer period in which to load the holes and to make other preparations before evaporation brought the explosive to the CO₂ point. Indeed, the CO₂ point, it appears, can be passed without materially diminishing the force of the explosion. It is stated that explosive action with cartridges of this kind can be obtained any time within two hours after they have been saturated and placed in the drill holes ready for detonating.

The liquid oxygen required for the demonstrating blast was delivered at Myerstown in forty 15-liter transportation bottles. The outward character of these may be seen in the accompanying illustration. These containers are so constructed that they minimize evaporation of their liquid-oxygen content while in storage or in transit. When filled and ready for shipment, early

of liquid oxygen was used over that necessary to insure the cartridges being above or at the CO₂ point after the lapse of a considerable period following their withdrawal from the soaking vessel.

To make it feasible to soak simultaneously 20 or more cartridges, an insulated tank was built for the quarry demonstration. This was a double-walled, box-like affair having the interspace filled with felt and the soaking chamber lined with copper. The picture shows the somewhat simple character of this tank. The container proved entirely satisfactory, and the loss of liquid oxygen by evaporation was surprisingly low.

The cartridges were soaked in the liquid oxygen for about 30 min. In the first lot 35 of them were so dealt with, enough to load seven holes. Then a second batch consisting of 25 cartridges was soaked, and when ready these were used to load the five holes remaining. All 12 holes were shot in unison. There was intentionally a lapse of 30 min. between the time the cartridges were in place in the 12 holes and the moment of firing. In fact, there was a total interval of 1 hr. and 35 min. from the moment the first of the cartridges was taken out of the liquid oxygen until the blast was set off.

To fire the 60 cartridges, there was hung in each hole from top to bottom a suitable length of TNT Cordau; and the 12 lengths of Cordau were connected above ground to a common trunk. A single cap on the trunk fuse served to set off all the charges at the same instant when detonated electrically. It was estimated that 4500 tons of rock were broken by the blast or 6.2 tons per lb. of L. O. X. employed.

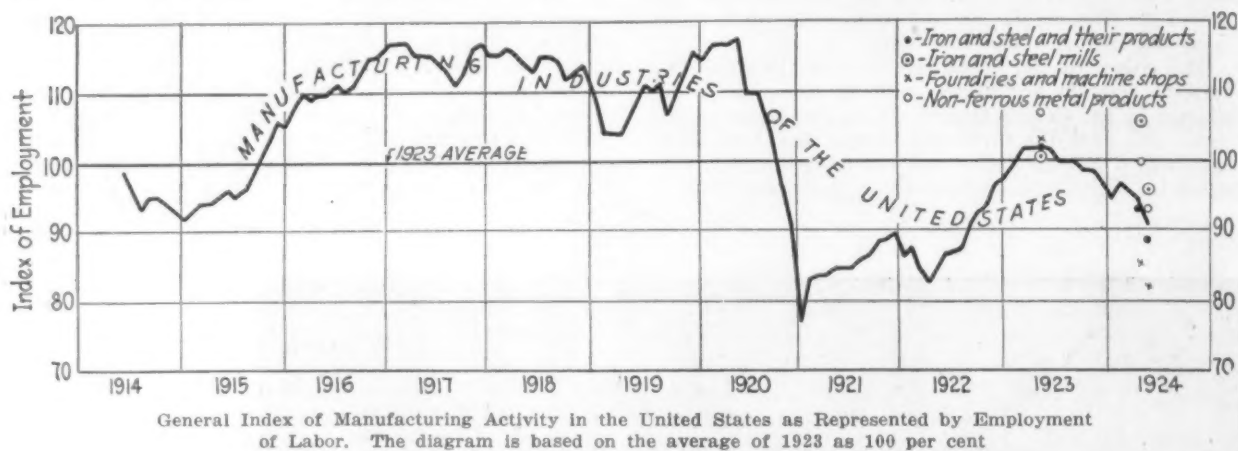
Reduction in Employment During the Last Year

Figures of the United States Bureau of Labor Statistics show the general level of employment in May to have been 91 per cent of the average of 1923, against 102 per cent in May of 1923 and 95 per cent in April of 1924. Reference to the chart shows that there has been a great reduction in employment over a period of about one year, from the 102 per cent extending through the second quarter of last year. The chart shows, however, that present employment is higher

Decrease in Industrial Activity in New York State

A decrease of industrial activity and a decline in employment throughout the whole of New York State is reported by Director General Francis I. Jones of the Employment Service of the Department of Labor.

"Part-time employment in manufacturing plants is quite general," he says of New York State. "Slight curtailment in employment obtains in the iron and steel industries, metal trades, foundries and machine shops, locomotive and railroad repair shops, collar and shirt,



than it was at any time between December, 1920, and September, 1922. The precipitous decline in seven months, from 118 in June, 1920, to 77 in January, 1921, is emphasized.

Specific points on the chart for May, 1923, and April and May, 1924, show the conditions in those particular months with regard to the general group of iron and steel and their products; iron and steel mills; foundries and machine shops and non-ferrous metal products. These show a wide variation; thus, the iron and steel mills are represented in May as 96 per cent of their 1923 activity, while the foundries and machine shops are down to 83 per cent, the two other classifications being in between. But the comparison between the steel industry and the general position should be noted. A year ago the iron and steel mills were below the general average, whereas in the most recent figures they are well above the average.

In general, the reports are based on 8569 establishments in 52 industries and covering more than 2,600,000 employees in May and more than 2,700,000 in April. The iron and steel group includes 1461 establishments, 588,668 employees in April and 553,698 employees in May.

Negotiations Under Way for Railroad Concession in Mexico

A group of American capitalists is negotiating with the Government of Mexico for the concession to construct a railroad between the cities of Durango and Mazatlan, according to current reports, says Assistant Trade Commissioner H. Bently MacKenzie, Mexico City. One of the chief objects of this construction is said to make possible the exploitation of timber resources in this region of a much lower cost than is now possible.

New Dock to Be Constructed in Argentina

An agreement has been entered into between the Government of Santa Fe and the Argentine National Government for the construction of new dock at the port of Santa Fe, according to a report from Ambassador J. W. Riddle, Buenos Aires. This dock is to be utilized exclusively for coastal and fluvial shipping and its estimated cost is 1,350,000 paper pesos (the paper peso is now worth \$0.325), of which 550,000 is to be provided by the Provincial Government and 800,000 paper pesos by the National Government.

worsted and knitting factories and in some instances automobile and accessory plants. Building and construction activities continue at a very encouraging rate and have absorbed a good portion of the released shop and mill labor. Farmers are experiencing less difficulty in obtaining the desired class of help."

Cold Storage Plant Discussed for South African Colony

At a recent session of the economic and financial committee of the Colony of Kenya it was recommended that, in view of the prospects for the export of dairy and pork products, a cold storage plant be erected at Mombasa. The government, therefore, has decided to allocate £25,000 from the loan funds for this purpose. An expert is being sought in South Africa to advise on the subject of machinery and management. The work is to be undertaken at an early date, says Vice-Consul Oscar Thomason, Nairobi, in a report to the Department of Commerce.

The United Engineering & Foundry Co., Pittsburgh, recently designed a new type of galvanizing machine, with drive inclosed, self-contained and separate from the pot. It is connected to the galvanizing machine by spindles and coupling boxes. The frame is of cast steel and rests on top of the pot, entirely free of the bath. The housing for the bottom rolls is made of a single slab of rectangular section attached to the frame above the bath, and unlike the ordinary machine on the market, has no gusset plate and rivets. The bottom rolls are driven through a worm in the bath and a set of fully inclosed bevel gears on top of the frame. A clutch is provided for disengaging the entering rolls from the drive. Front and back guides for the bottom rolls can be removed without removing the machine from the pot.

It is learned on good authority that an eight-story apartment house, modern in every respect, equipped with three elevators, with stores on the street level, is to be erected in Shanghai, says Trade Commissioner G. C. Howard. It is understood that work will be started within the year. This will supply to some extent an outlet for the demand for living space in the business area.

Brittle Range in Low-Alloy Steels

Behavior of Austenite During Quenching and Drawing a Probable Cause—Sensitive Method of Measuring Change in Volume

BY MARCUS A. GROSSMAN*

THE existence of a brittle range in steels containing a small percentage of alloy has been recognized for some time. When such steels are hardened and are then drawn, there is a particular range of drawing temperatures which must be avoided because the steels which have been drawn in that range are quite brittle. That is to say, in order to impart toughness to a quenched steel, the steel may be drawn progressively up to a certain temperature, and then if further toughness is desired it is necessary to increase the drawing temperature suddenly several hundred degrees, as any intermediate ranges cause brittleness.

Attention was directed to this phenomenon by Dr. J. A. Mathews (Year book of the American Iron and Steel Institute, 1921, pages 147-151) in a discussion on chrome-molybdenum automotive steels. The brittleness is shown in his curve of Izod values, the energy absorption in breaking in impact. This curve shows a minimum toughness (maximum brittleness) for pieces drawn at 650 deg. Fahr., after which the toughness increases on further drawing. Reference is also made to a report of the British Institution of Automobile Engineers, stating that similar phenomena are in evidence in chrome-nickel steels.

It is the purpose of the present paper to show that this phenomenon, which probably occurs in all low-alloy steels, is due to the fact that a small amount of austenite is retained as a structural constituent when the steel is quenched. This austenite is stable up to certain drawing temperatures, but is then broken up, more or less completely depending on the temperature (and the time) of drawing. The resultant brittle sub-microscopic alpha iron interspersed throughout the remaining steel microstructure would account for the brittleness.

Since the proportion of austenite is very small, its presence could not be demonstrated by the commoner methods. There was far too little to give any definite evidence under the microscope. The proportion was also too small to produce any marked secondary hardness when the austenite was broken up, upon drawing. The Brinell values, scleroscope numbers and Rockwell numbers all fall off quite regularly with progressively higher draws, without being affected by the breaking-up of the austenite.

There is available, however, a very sensitive method of detecting changes in the structure of steel, namely, measurement of the changes in volume. These volume changes can be followed very readily by observing changes in length of suitable specimens. If a piece of steel contains martensite, or martensite and troostite, then heating will cause carbides to form and grow, and cause grain-growth, resulting in contraction of the steel. If, then, a piece of such martensitic steel is measured, and if it be then heated to some low temperature and then cooled to room temperature and re-measured, its length will be found to have decreased. (Throughout this discussion, no account will be taken of pure thermal expansion upon heating or contraction on cooling. The changes in length all refer to measurements made at 68 deg. Fahr., the increments or decrements being brought about by structural changes, which took place at the drawing temperatures named.)

If a piece of steel contains austenite, the breaking-up of the austenite upon reheating results in expansion, due first to the lesser density of alpha iron as compared with the gamma iron of austenite, and second to the excessively fine grain of the alpha iron and the atomic dispersion of the elements of the carbides. When steel

containing austenite is reheated to progressively higher temperatures, it does not change in volume until it reaches the temperature at which it is transformed (it must be remembered that thermal expansion is disregarded), and then its transformation can be followed readily in the changes in length.

If now we have a piece of steel containing both martensite and austenite, it is evident that reheating will cause complicated changes in length (volume). Upon drawing at very low temperatures, the atomic re-arrangement due to incipient decomposition of the martensite will cause initial contraction. Then when the reheating temperature reaches a value at which the austenite is transformed, expansion will set in, in an amount bearing a definite relation to the proportion of austenite which was present. In the meantime the contraction due to break-down of the martensite continues, so the net change is the arithmetical sum of the two. When the austenite has all been transformed, the piece will ultimately contract to the dimensions of the annealed condition.

A conspicuous example of the changes in reheating mixtures of martensite and austenite is found in high-speed steels. It is now generally recognized that a piece of high-speed steel, quenched from the proper hardening temperature, consists of a mixture of austenite and martensite, probably in about equal proportions. When such a mixture is reheated to low temperatures, the martensite is decomposed, softens and contracts. When the drawing temperatures are raised, a range is reached around 1100 deg. Fahr., where the austenite is transformed and expands. Beyond that range, general contraction sets in.

This has been reported in detail by the present author (*Trans. American Society for Steel Treating*, May, 1922, p. 691, and discussion July, 1922, p. 890; *Chemical and Metallurgical Engineering*, vol. 27, Sept. 13, 1922, p. 541). It has also been shown by the present author that the transformation of the austenite in high-speed steels at 1100 deg. Fahr. is accompanied by the development of a certain degree of brittleness (*Trans. American Society for Steel Treating*, August, 1922, p. 1001). Thus, high-speed steels become progressively tougher as they are drawn at low temperatures, up to about 900 deg. Fahr. But when they are drawn in the neighborhood of 1100 deg. Fahr., their austenite is transformed and they develop a certain brittleness in this range, and the change can be observed in the expansion.

The same general method of attack has been applied to the present problem. The toughness was measured by impact tests in a machine of the Charpy type, and the changes in dimensions were measured with dial instruments and with hand micrometers.

The steel selected for test was a chrome-molybdenum steel of the type commonly used for automotive structural purposes. In the course of the tests it became necessary to use steels from two different heats, but their compositions were much alike and were in the following range:

	Per Cent
Carbon	0.49—0.53
Manganese	0.60—0.70
Chromium	0.80—0.95
Molybdenum	0.30—0.35

The impact tests were carried out on specimens quite similar to Charpy test pieces. For convenience, the specimens were cut directly from $\frac{3}{8}$ -in. sq. hot-rolled bars. They were made 2.17 in. (55 mm.) long. To avoid any uncertain hardening effects at the notch during quenching, the notch was cut in the test piece

*Metallurgist, Atlas Steel Corporation, Dunkirk, N. Y.

only after the latter had been hardened and tempered. A notch 1/16 in. deep was then ground into the piece by means of a very thin carborundum "cut-off" wheel.

The test pieces were all quenched from 1550 deg. Fahr. into oil. Eight sets were drawn at the following respective temperatures: 300, 350, 450, 550, 590, 650, 750, 790 deg. Fahr. Generally six pieces were drawn

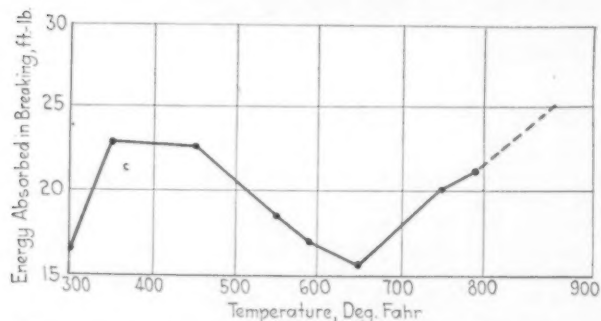


Fig. 1—The Variation of Toughness (Energy Absorbed in Breaking) with Change in Drawing Temperature

at each of the temperatures, so that the impact values given in the table represent the average of about six tests each. The energy absorbed in breaking, after the draws at the temperatures indicated, were as follows:

Drawing Temp., Deg. Fahr.	Charpy Value, ft.-lb.
300	16.4
350	23.0
450	22.6
550	18.6
590	17.0
650	15.6
750	20.1
790	21.2

These values are plotted in the graph Fig. 1, and show the sharp minimum at 650 deg. Fahr. When the steel is drawn at this temperature, it is more brittle than when drawn at any other temperature, to as low as 300 deg. Fahr.

In following the changes in dimensions, the several instruments shown in Fig. 2 were used. The earlier measurements were made with hand micrometers, reading to 0.001 in. and interpolating to 0.0001 in. Subse-

quently the two dial instruments were used. One of these is furnished with an Ames dial reading to 0.001 in., and a 10:1 multiplying arm, so that the dial indicates 0.0001 in., interpolating to 0.00001. The other instrument, a Federal dial, reads directly to 0.0001, interpolating to 0.00001 in.

Four series of readings were taken. In three of them, the same test pieces were used for the successive draws, and the progressive changes noted. The total change from the quenched condition to the drawn condition, therefore, showed not only the effect of the final draw but also the cumulative effect of all the intermediate draws. In the fourth series, however, freshly quenched pieces were prepared for each drawing temperature, so that only the effect of the draw at that temperature was observed. The treatment of this last

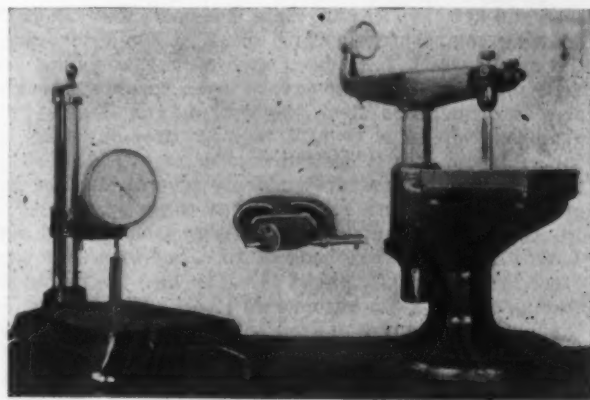


Fig. 2—The Instrument Used in the Measurements of Dimensional Changes

series would correspond to that given the impact test pieces.

The values obtained in the several series are plotted in the graphs of Fig. 3. All of the specimens were about 2.5 in. long, and the total contractions of the piece are plotted in each graph. The first graph, Fig. 3 A, shows the changes in length in drawing a cylinder

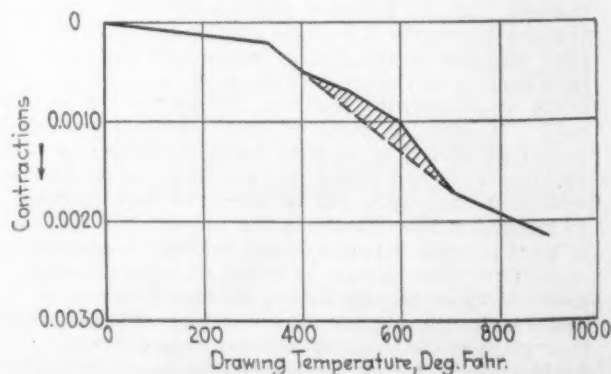
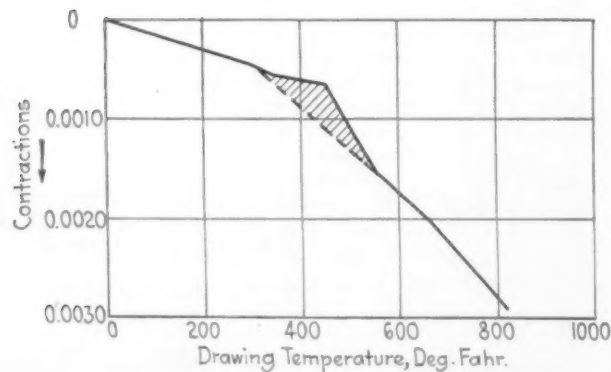
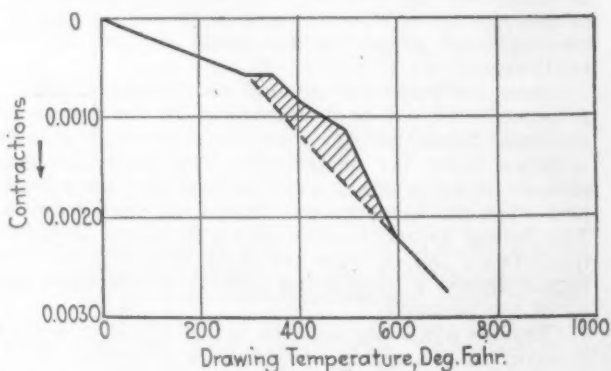
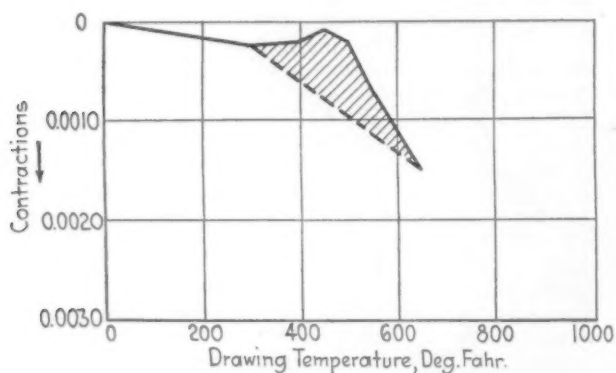


Fig. 3—Contractions Observed upon Drawing the Quenched Steels. The cross-hatched areas represent transformation of austenite. In Fig. 3A, (upper left hand), the test pieces were 1 1/2 in. dia. quenched at 1550 deg. into oil, cumulative. In Fig. 3B, (upper right hand), the test pieces were 3/4 in. sq. quenched at 1800 deg. oil, cumulative. In Fig. 3C, (lower left hand), the test pieces were 3/4 in. sq. quenched at 1550 deg. into oil, cumulative. In Fig. 3D, (lower right hand), the test pieces were 3/4 in. sq. quenched at 1550 deg. into oil, non-cumulative

1.5 in. in diameter, 2.5 in. long, which had been quenched from 1550 deg. into oil. (The specimen had been made of this size to permit protecting the ends, so as to measure also the expansion on hardening). The draws were cumulative. The full line shows the total contractions from the quenched state. The dash line shows the contraction that might have been expected had there been only contraction due to destruction of martensite with no coeval transformation of austenite. The cross-hatched area therefore may be taken to represent the expansion due to transformation of austenite.

Fig. 3 B represents similar values obtained on a $\frac{3}{8}$ -in. sq. bar quenched into oil from 1800 deg. Fahr. Fig. 3 C represents similar values on two $\frac{3}{8}$ -in. sq. bars quenched into oil from 1550 deg. Fahr. In these first three graphs, the values shown represent the cumulative effects of all the draws up to the temperatures indicated. In the last graph, Fig. 3 D, each point represents values on a new set of test-pieces, there being no cumulative effects.

To afford visualization, Fig. 4 shows how the expansion due to transformation of austenite may combine with the contraction due to destruction of martensite. The curve from 325 to 900 deg. Fahr. in Fig. 3 D is divided into two elements, Fig. 4 A representing the expansion due to transformation of austenite and Fig. 4 B representing the contraction due to progressive destruction of martensite. If these two curves are added numerically, they will be found to combine to form Fig. 4 C, which is the same as Fig. 3 D.

It would appear, then, that the drawing temperature for maximum brittleness (minimum Charpy value) in the curve of Fig. 1 coincides quite satisfactorily with the maximum transformation of austenite, as indicated especially in Fig. 4 A. It will be recalled that the curve here analyzed is that of Fig. 3 D, the one showing non-cumulative draws, and this corresponds to the treatment given the impact test pieces. There appears to be little doubt that the retention of austenite in

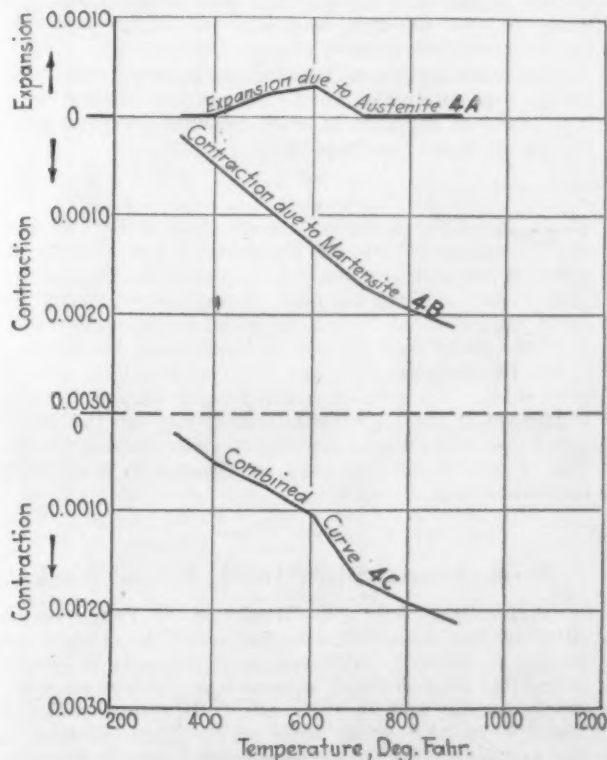


Fig. 4—The Combination of an Expansion Curve with a Contraction Curve

quenching, and its subsequent liberation on drawing, accounts for the observed brittleness.

It remains to be acknowledged here that the presence of austenite in low-alloy steels had been deduced simultaneously and independently by Howard Scott of the Bureau of Standards. Although not accompanied by impact tests, expansion investigations had evidently

been carried on at the same time as those reported here, for they have since been recorded in the Progress Reports of the Gage Steel Committee of the Bureau of Standards.

It is believed that consideration of the presence of austenite will explain many apparently anomalous features in the behavior of low-alloy steels and even of carbon steels, when hardened by quenching and then drawn at low temperatures.

Obsolescence of Tools and Patterns Used in Electrical Industry

"When Do Tools and Patterns Become Obsolete?" is the subject of a report adopted at the annual meeting of the Electric Power Club held at Absecon, N. J., May 25 to 29. The subject is regarded as of outstanding importance to both users and manufacturers of electric power apparatus and control equipment, although the question is recognized as one to which a definite reply is difficult, if not impossible.

It is pointed out in the report, which was submitted by the club's committee on obsolescence, that the constant change in product, due to development of new designs, with the implied obligation for providing repair and supply parts for all the various sizes, types, and modifications of motors, generators, control and other equipment, imposes an increasing burden upon the manufacturer. Usual practice is said to be to continue provision for the prompt supply of repair parts for three to five years beyond the time at which machines have been superseded. However, it is the practice to furnish such parts for an indefinite period after the machines themselves are no longer manufactured, but on such shipment and at such prices as are applicable to job work.

In regard to scrapping the obsolete, it is given as fairly general opinion that the frame patterns and also other patterns and special tools used in the manufacture of motors, generators, etc., that are not particularly expensive or complicated but require relatively large space for storage, may be discarded at the end of two or three years after such equipment has been superseded. The theory is that if the owner of the motor or generator has charged off adequate depreciation from year to year, he should be in a position to purchase new equipment when the old has become obsolete.

Taking into consideration wear and tear, obsolescence by reason of advances in design, the average useful life that may be assigned to a general motor or generator receiving ordinary care and attention is given as 12 to 15 years. "If this be true," the report states, "then possibly the obligation of the manufacturer to supply repair and renewal parts promptly and at prices based on manufacturing in reasonable quantity may cease within three or at most five years after a line becomes obsolete."

The full report is given in bulletin No. 2000 of the Electric Power Club, of which S. N. Clarkson, B. F. Keith Building, Cleveland, is secretary.

Management Week, to be observed by five national societies, will be this year the week of Oct. 20-25. The plan is for more or less simultaneous management discussions in 75 localities throughout the United States and Canada. The national committee has been appointed as follows: Henry Bruere, American Management Association; Sterling H. Bunnell, American Society of Mechanical Engineers; W. H. Leffingwell, Taylor Society; E. M. Robinson, Society of Industrial Engineers, and C. R. Stevenson, National Association of Cost Accountants. Ernest Hartford, 29 West Thirty-ninth Street, New York, is secretary of the committee.

The tax valuation of Lake Superior ore on Ohio docks has been fixed at \$3 per ton by the taxing officials of the six counties in which the ore docks are located. This ore was returned by the owners for taxation purposes at \$2.50 a ton. Last year the tax valuation placed on dock ore was \$3.25 a ton.

BUILDING IN SEATTLE

New Construction Active, but Buying Drags and Prices Are Low

SEATTLE, WASH., July 10.—New building construction in Seattle and nearby districts continues to be the heaviest ever known, and shows no signs of lessening in the near future. A local authority estimates that close to \$20,000,000 worth of new building is now under way within a radius of 10 or 15 miles of Seattle. The Seattle Chamber of Commerce has just started work on a new home for itself on Third Avenue in this city that will cost about \$250,000 or more.

The Pacific Coast Steel Co. has taken about 450 tons of reinforcing steel bars for the new Doctors and Dentists building now under erection in Seattle. Contracts for the reinforcing steel for the Elks and the Eagles buildings to be erected here are expected to be placed in a short time. It is estimated that both buildings will require close to 1000 tons.

If any change has taken place, steel conditions in Seattle and nearby territory are quieter now than at any time since the recession in demand all over the country started. Conditions here are much the same as in other larger and more important steel consuming centers, as jobbers are buying only for nearby needs and consumers are doing the same, feeling that nothing is to be gained by anticipating needs in view of the very uncertain outlook. Also, the feeling prevails here that not much betterment will come until after the election is over, and it is known definitely which political party will be in power over the next four years.

Very Low Prices

In conditions such as prevail now, when there is not enough business to go around, prices always suffer, and the present is no exception. Some relatively low prices have lately been made here on only moderate sized jobs of steel work, and it is claimed that the concerns that took these jobs are certain to suffer a loss. A case in point is that of a State-county bridge at Harrisburg, Ore., involving only 450 tons of shapes, which, if reports are correct, was taken by a local company at 5.25c., laid down beside the job, fabricated, ready for erection. Very low figures have also been made here recently on work involving soft steel and reinforcing bars.

Unemployment Increased in Pennsylvania Iron and Steel Centers

HARRISBURG, PA., July 16.—The iron and steel trade of Pennsylvania, as of July 1, has been at its lowest ebb thus far in the present slump, according to the industrial report for the two preceding weeks to Dr. Royal Meeker, Secretary of Labor and Industry. In many districts plants are operating at approximately 40 per cent capacity, and over the Fourth many plants were shut down, some for one week, some for 15 days and in some cases for 30 days.

Erie reports that its iron and steel firms have experienced the greatest decrease of activities of the slump during the preceding two weeks. DuBois says that its railroad shops are barely operating. Williamsport finds very little activity in any plants, with its largest foundry closed for two weeks.

Pittsburgh reports about the only demand to be for workers of special types requiring considerable skill and experience in particular classes of work. The number of applicants for employment is large. Harrisburg finds its plants operating at a very low basis, with prospects of further reductions in working forces. The Bethlehem Steel Co. plant at Steelton is inactive. Another blast furnace has been banked recently, and its mills generally are working far below capacity. Many skilled and semi-skilled workers have been thrown on the market.

Conditions in the Scranton district, as in all others, are far below normal. More than 300 men employed in the Dunmore and Avoca shops of the Erie Railroad are reported to have been laid off. Johnstown's survey

shows its mills operating considerably below 40 per cent capacity. Firms of the district are said to be virtually without any unfilled orders, while officials say they expect no improvement during July. Work on plant improvements is not expected to get under way until the latter part of July or the first of August.

In Philadelphia the Sun Shipbuilding Co. was to have added 100 men to build freight barges for the Baltimore & Ohio Railroad. Conditions at the Baldwin Locomotive Works are said to be improving slowly. The Westinghouse company in Chester is employing toolmakers and die sinkers.

Serious Foreign Competition

Demand for soft steel merchant bars is also limited, with low prices being made. The Pacific Coast Steel Co. largely controls the local steel bar market, and it is naming 2.50c., rail delivery in the Seattle district. In the Pacific Coast market bars are pretty badly demoralized, as is evidenced by a letter recently sent out to the trade by the Judson Mfg. Co., which operates an open-hearth steel plant and finishing mills at Oakland, Cal., its main offices and warehouses being in San Francisco. This letter says in part:

The steel mills of Germany and Central Europe have taken advantage of their extremely low rate of exchange, their low labor and transportation costs, and are using the ports of the Pacific Coast as a dumping ground for their products. The docks and warehouses of San Francisco are crowded with European steel in sections of rounds, squares, flats, bands and bar angles.

It is therefore necessary, in order to meet this condition, to disregard our usual methods of distribution, and appeal to you direct.

We have warehouses in San Francisco and in Oakland, and carry large stocks in a full range of merchant bar sections in rounds, squares, flats, bands and bar angles. This stock is all new-rolled open-hearth mild steel, and of the quality specified by our American standards. Our organization is prepared to give you immediate service. Our price until further notice will be \$2.50 per 100 lb. base in carload or in less than carload, f.o.b. cars or warehouse San Francisco. We will give equal attention to your orders in one bar or carload quantity.

Under the conditions noted above it would seem that unless more protection is offered against foreign steel, it is bound to supplant in large measure domestic steel for Pacific Coast consumption.

Pennsylvania Silica Brick Prices Weak

PITTSBURGH, July 14.—Weakness of Pennsylvania silica brick is the outstanding feature of the refractories market at present. Although much capacity is idle on account of slack demand, several manufacturers remain in production and in their effort to secure sufficient business to keep going some of them are quoting as low as \$35 per 1000. The regular quotation on Pennsylvania silica brick is \$38, but those holding to that price have not lately succeeded in securing many orders. Competition is less severe apparently in other districts, as recent prices are well maintained. Clay fire brick prices are holding well; current demand is moderate, but most makers have a fair run of old orders against which specifications are steadily made. Chrome brick are down \$2 per ton to \$45. Grain magnesite and magnesite brick prices are unchanged. Prices are given on page 176.

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ESTABLISHED 1855

THE IRON AGE

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Uneven Steel Prices

NO one who takes much interest in the steel market fails to observe the divergences that have developed between prices of the different commodities. The last advance in the rail price occurred late in 1922, while all the other important finished steel products had their final advances in April, 1923. The price structure existing May 1, 1923, was presumably a well rounded out and coherent one. At any rate, there was much confidence in it, and it held, with some slight irregularities, for a considerably longer time than the steel market usually does hold. It furnishes, therefore, a more or less reasonable basis for comparison.

Some important forms of rolled steel have had repeated and substantial declines, some have had slight declines and some have had no decline at all. It is unnecessary to particularize as to the commodities, the facts being well known.

No one is likely to argue that the divergent behavior of various products is due to differences in the relation between cost and selling price. The substantial fact is that the mills individually have all been seeking more or less to maintain prices, but differences in the character of orders offered or differences in the keenness of competition have led to these different market results. In certain products, relatively large orders are sometimes offered, in other lines the orders regularly run small, and it is more worth while for the seller to sharpen his pencil in one case than in the other. Then there are differences in the position of the buyer. The buyer may be one of a class, and if he is given a special price others in the class will clamor for that price. In another case he may be by himself and no one is put out by a concession being made him.

In all classes of steel commodities there is competition, but in the various steel lines there are differences in the number and the personal characteristics of the sellers, and that makes a difference in the extent to which competition produces lower market prices.

The trade practice is altogether unscientific and from some viewpoints it is unreasonable, but it is all that is left for the sellers, who are prohibited from getting together even informally to regulate prices in any manner, however scien-

tific. Any regulation is regarded as inherently wicked, hence the sellers of steel are forced to be opportunists. If a mill makes two products and prices are cut in the one the mill becomes the more jealous as to prices in the other line. Its only hope may be that profits will remain in that department.

This hold-as-hold-can practice has produced vagaries besides those apparent in prices of cognate finished products. Divergences have developed between semi-finished and finished materials. Skelp prices take their lead from bars and plates instead of from pipe, while sheet bars are in the awkward position of being the raw material of two entirely different finished products, one of which has declined while the other has not.

Finally, pig iron and steel have found it quite impossible to move together. In the past two years there has been no harmony between pig iron and steel price movements. Yet the time is easily within the memory of the present generation when it was a common practice to sell steel on contract with the price to be determined month by month by the ruling price of pig iron.

Machine Tool Buying

MACHINE tool orders in June, according to the records of the National Machine Tool Builders' Association, were the lowest since March, 1922. The volume of business has shown a substantially steady decline from January, when orders amounted to about 67 per cent of the 1920 monthly average, to June, when the amount was 27 per cent. The monthly average so far this year is about 50 per cent of the 1920 average and compares with about 60 per cent for 1923. Figures over a number of years indicate a falling off in machine tool orders two and three months in advance of the beginning of a down-trend in pig iron production and generally a lag of about the same interval before improvement is shown after an up-turn of pig iron output. Accordingly, the immediate outlook, if history is to repeat itself, is for meager machine tool sales until a definite increase in pig iron making is indicated.

What the machine tool user may get out of this is the suggestion that the present ought to be a good time to replace obsolete tools. Metal

prices have declined out of relation to most other commodities and will be sensitive to improvement under the influence of low stocks and easy money. Correspondingly the item of cost in the competitive manufactured metal product has not always been considered in current transactions, and on the first signs of a change for the better in general industry, the machine tool builder, if he takes courage from the experience of the past, will watch prices in terms of cost, however eager he may be to build up a backlog.

The Pig Iron Cost Line

MERCHANT pig iron producers the country over have been under the harrow for many months. Prices have declined steadily and in general are \$7 to \$8 per ton below those of a year ago, while in comparison with the high point reached in April, 1923, the drop has been \$11 or \$12 per ton. Furnace after furnace has been blown out because it was impossible longer to pile high cost iron. In many cases the compelling reason was that the market price of pig iron had gone below the furnace company's cost line.

Eastern pig iron producers in particular have been sufferers. Out of 21 merchant furnaces in New Jersey and the Lehigh and Schuylkill Valleys of eastern Pennsylvania, only 5 were in operation as July came in.

Under such conditions Eastern blast furnace owners were far from complacent readers of a comment on the pig iron market which appeared in New York and Philadelphia papers in the past week, informing the public in general and consumers of pig iron in particular that "well informed observers believe some of the modern pig iron plants could turn out their product for about \$16 a ton, even if they pay going prices for coke, ore and transportation."

The observers referred to are evidently "unofficial observers" and what they "believe" about pig iron costs needs to be differentiated sharply from what they know on the subject. It is to be doubted that the best equipped merchant furnaces in the three districts named above could come within \$4 a ton of the \$16 figure named in the daily newspaper article; and there are a good many Eastern furnaces to which pig iron consumers must look for their supplies in ordinarily active times whose cost, were they operating today, would be \$5 to \$6 a ton above \$16. With Connellsville coke at \$3 at oven and coke freight close to \$3.50, coke cost would be above \$7 per ton of iron. With Eastern or foreign ores at 9½ to 10 cents per unit at eastern Pennsylvania furnace, we should have the \$16 exceeded by ore and fuel costs alone.

We must go back to the deep depression in the summer of 1921 to find pig iron prices comparable with those now prevailing in eastern Pennsylvania. Costs are higher today than they were four years ago; at the same time consumption of merchant pig iron is plainly at a higher rate now than it was in the second half of 1921. That 16 out of 21 merchant furnaces in three Eastern districts are idle today is evidence in itself that a market price \$4 or \$5 above the

apochryphal \$16 cost does not permit profitable operation. To call these furnaces back into activity will require that turn in the pig iron market that always comes after months of curtailment have demonstrated to both consumer and producer that stocks are disappearing and that consumption is steadily running ahead of output.

The Real Political Menace

BUSINESS, whether big or otherwise, has paid no great heed thus far to the declarations of the two old parties, neither departing in any marked degree from the expected. But it has found a real menace in the LaFollette platform, particularly the third, tenth and eleventh sections written by the Senator from Wisconsin in the following words:

(3) Public ownership of the nation's water power and creation of a public super-power system. Strict public control and permanent conservation of all national resources, including coal, iron and other ores, oil and timber lands, in the interest of the people. Promotion of public works in times of business depression.

(10) Repeal of the Cummins-Esch law. Public ownership of railroads, with democratic operation, with definite safeguards against bureaucratic control.

(11) Abolition of the tyranny and usurpation of the courts, including the practice of nullifying legislation in conflict with the political, social or economic theories of the judges. Abolition of injunctions in labor disputes and of the power to punish for contempt without trial by jury. Election of all Federal judges without party designation for limited terms.

There is a serious possibility that the LaFollette party by carrying a few States may be able to throw the election of President into the House and that of Vice-President into the Senate. The Constitution of the United States provides that if no candidate for President has a majority of the members of the electoral college, the House of Representatives shall elect a President from the three receiving the highest number of votes for President; and if no one has a majority for Vice-President, the Senate shall elect a Vice-President from the two having the highest number of votes at the preceding election for that office. It is further provided that if the House shall not choose a President before the fourth day of March, then the Vice-President shall act as President.

It so happens that at the present time the Congress which may have these important duties imposed upon it consists in the House of 20 States which are Republican, and it is safe to presume that each of the 20 would cast a vote for Coolidge, while 20 States are Democratic and each would cast a vote for Davis, while 3 States are nominally Republican but are controlled by Senator LaFollette, and five States are evenly divided between the two old parties. Under these conditions it can be seen how a deadlock might occur, and then the Vice-President, if one had been elected by the Senate, would act as President. It is also true, however, that no one party is clearly in control in the Senate and whether

the senators would be able to come to a conclusion is uncertain, although each senator has one vote and only a majority of the whole number is necessary for a choice. With neither a President nor Vice-President selected, it is not clear who would be the President. Serious confusion might arise.

We believe this statement of the possibilities is enough to indicate to members of the old parties that their chief business in this campaign is to keep the new party, with all its radical aims, from getting enough votes to bring about the chaos which is easily conceivable. Certainly at no time in years has it been so clear that it is the duty of the business men of the country to take an active part in politics and prevent LaFollette Socialism from becoming a greater power than it is today at Washington. The LaFollette program not only advocates public ownership of railroads and public control of all national resources, but also would abolish injunctions in labor disputes and the power to punish for contempt without trial by jury. It would take away the safeguards the Constitution provided for an independent judiciary, free from the fickleness and sudden impulse of popular opinion. These proposals of LaFolletteism must be combated to the utmost by all who have the best interests of the country at heart.

Great Gains in Accident Prevention

THE Worcester County Safety Council, whose membership includes most of the large metal-working plants and others of the industrial works of Worcester, Mass., and its county, has proved conclusively that long-continued competition between establishments or departments of the same establishment, with the purpose of reducing accidents, has important cumulative results. A contest between member firms has gone on for several years, the goal being months without a lost-time accident. Each successive year has seen an improvement in average records. The greatest gain of all has been in the past year, as shown by a comparison of the first four months of 1924 with the corresponding months of 1923.

The reason, it is believed, is not an intensified interest and effort, but rather the educational influences that are at work. Knowledge of hazards has become more general, carelessness is less common, caution has become more and more the habit. These factors combine with more general and intelligent application of mechanical and other safeguards, and of emergency measures. The pride of owners and managers has been aroused, also the pride of superintendents and safety engineers and foremen, as well as of the workmen themselves. If in the chain of interest a weak link develops, the defect is quickly noted and the remedy applied. Those higher up want to see their firm's name on the monthly honor roll, and when it fails to appear expect to know the reason. Even an injured man, if his accident was due to his own carelessness, is sometimes regarded as lacking in team spirit.

In the first four months of 1923, with an aver-

age of 24,122 employees on the payrolls of the Worcester County firms reporting, the monthly average number of accidents was 84 and the number of resultant lost-time days was 1492. In the same period of 1924, with an average of 24,704 employees, the number of accidents was 56 and the number of lost-time days 1164. The decrease in the number of accidents was 33 per cent, in the lost-time days 22 per cent.

The decrease was due to no special effort, nor to any change in character of the personnel of the workers. There was no drive to stimulate interest. No extra-hazardous business dropped out. A number of the firms operate large numbers of presses and punches. Close to 10,000 of the employees are employed in wire mills, which are commonly considered to have many hazards. Yet both the North works of the American Steel & Wire Co., with 2500 men, and the South works, with its more than 3000 men and operating steel furnaces and rolling mills, are not infrequently on the honor roll.

The contest is unusual, perhaps not in itself so much as from the fact that it has been continued year after year without any letting-up of interest and, in a sense, of enthusiasm. The members have seen its success, and would be loath to give it up. Each month the honor list of firms which have operated without a lost-time accident is published in the daily newspapers. A plant employing less than 500 persons is permitted no accident, even though the lost time involved is only a single day. A plant employing more than this limit is permitted to have one accident for each additional 500 and still get on the honor roll. This was considered necessary in the interest of fair play, that the smaller companies should not gather to themselves too large a share of honor. Where there are very large departments, each is reported as an individual unit. For example, the North, South and Central works of the American Steel & Wire Co., the wheel and machine divisions of the Norton Co. and the Wright, Goddard, National, Morgan, Spencer, Clinton and Palmer divisions of the Wickwire-Spencer Steel Corporation.

A NEW ENGLAND machine tool company announces the closing down of its shops and offices for two weeks, during which nearly all members of the organization will take their vacations. One advantage referred to in the announcement is that in the remainder of the summer the company will be able to give its customers better service than under the old plan of individual vacations, "which impaired the efficiency of the organization all through the summer months." Naturally a time like the present makes a management receptive to the suggestion of a complete shutdown. When capacity is well taken up, the release of but a fraction of the whole number of workers at one time is ordinarily the only plan entertained. But in office work in particular, the drawbacks of such doubling up of work as is often necessary in connection with vacations in relays are such as to argue strongly for the concentrated suspension. The inconveniences are minimized, the

interval is soon over with, and for all the remainder of the usual vacation season departments are fully manned and service is well maintained.

Income and Prosperity

DURING the period of nearly six years that has elapsed since the Armistice the great question as to our business and economic affairs has been whether we have been in a state of real prosperity or merely in a state of activity.

We have had, in the main, a large income. The total income of the people, expressed in dollars, has been of course very high, and allowance must be made for increase in population. After such allowances have been made the per capita income reduced to pre-war values, or in other words to a commodity basis, has been fairly large. Viewed from another angle, there has been on an average a smaller volume of unemployment of labor than was the average for any considerable period before the war.

Experiences in the panic of 1873 and the five or six years of depression that followed illustrate strongly the difference between activity and prosperity. There had been very unusual activity from the end of the Civil War up to the panic, but the shaking out of the 'seventies showed that this activity had been accompanied by much less prosperity, or advancement, than had been assumed. Apparently much "wealth" had been created, but it turned out that this was largely on paper. Useful facilities, including railroads, had been created, but profits were lacking. The facilities did not have earnings in proper relation to their cost.

When it comes to making out that we have had prosperity since the Armistice, and are going to have a continuance of such prosperity for

several years more, the arguments are in some respects a trifle lame. More is said about the number of dollars men receive as income than is said about what men receive when they come to spend these dollars. Much is made of the building statistics, representing the dollars that are paid out, and much less about the comforts men are enjoying in their new homes. It is a matter of common remark that these homes are very small. Then there is much reference to the smallness of unemployment since the Armistice. That is really rather cold comfort. Unemployment is not natural. In primitive times men may have had to forage far and wide at times for food, but at any rate they did not lack employment.

It will probably be granted by men of healthy minds that prosperity should bring contentment, for if not there is not much use bothering about anything. Contentment we do not find, in very large measure, and here the symptoms tend to raise some suspicion as to the reality of the prosperity.

There are related symptoms that should not be disregarded, and in particular the favor accorded to things that would represent robbing Peter to pay Paul. The last Congress insisted on trying to "soak the rich" so that the poor would have less taxes to pay. There is a large contingent that would starve the railroads in order to put down rates on farm products. Again, recent reports of short crops and advancing grain prices have been viewed with satisfaction in many quarters as representing a division to the farmers of income of the rest of the people.

We have this comforting conclusion, however, that if we have not had as much prosperity as we thought since the Armistice, we have not produced a situation from which extrication should be difficult. We have not strained credit and we have not built the wrong things.

CORRESPONDENCE

The Metricist

To the Editor: Your article on page 93 of the July 10 issue of THE IRON AGE regarding the metric system was read with interest.

Ball bearing manufacturers are forced by precedent to use the metric system for external dimensions, though it is significant that by preference they use the inch system for all internal calculations and dimensions.

Is it stupidity, general cussedness or inexperience that impels the metric enthusiasts? Or is it foreign propaganda in the hope they will be able to flood our markets with goods to metric measure before our manufacturers could make changes?

For purposes of parlor discussion, it is fine for the gentleman valiantly supporting a cup of tea and piece of cake to explain to enthusiastic admirers that one liter is one thousand cubic centimeters, or some such thing, and to demonstrate its simplicity with carefully prepared calculations.

But unfortunately Nature is equally indifferent to the yard stick and meter. Fluid flow through an orifice refuses to come in even figures, no matter what base is used.

Did the parlor theorists ever see a trigonometric table? Did they ever see the sine, cosine or tangent of an angle that reduced to even figures? It is easier to use thousandths and decimals of an inch, generally accepted mechanical standard of this country, than some long drawn out decimal of some other decimal, as the metric enthusiasts imagine they desire.

Let the gentlemen cease their vain imaginings, and go get jobs (provided they are able) in surveying, in the drafting room, in the shop. Those who survive the ordeal will realize the mistake of their metric enthusiasm.

Will these same enthusiasts please go to Russia? Any misshapen scheme will fit the crazy quilt over there. We have too many important things to do here to take the whole works apart, just to see if we can ever get it together again.

I knew an estimable lady, charitably inclined according to her lights. She used to attend the women's foreign missionary society and sew baby clothes for the poor little benighted black heathen of Africa, who warmed by the sun and washed by the dew just grew, while her own infant sat at home on the floor in unsanitary clothes, with molasses and a feather on his fingers to keep him busy until she returned. Such is fanatical enthusiasm based on ignorance.

L. LANGHAAR
Langhaar Ball Bearing Co.

Aurora, Ind., July 12.

BOOK REVIEWS

Factory Management.—By Henry Post Dutton. Pages 329, 5 x 7½ in.; illustrations and diagrams, 71. Published by the Macmillan Co., New York. Price, \$2.75.

This admirable work is the latest (let us hope, not the last) of a number with which such able writers as Metcalf, Church, Taylor, Gantt, Knoepfel, Gilbreth, Barth, Thompson, Vandeventer, Halsey, Goldman, Nicholson and others have benefited the manufacturing guild. It differs from most of similar or equivalent titles in paying more attention than they to financing, purchasing, selling and advertising, and has the merit of being specific in many of its examples; not saying: "A certain firm," but naming Eversharp, Ford, Franklin, Westinghouse, etc., which is much more convincing.

In his classification of the functions of production he is not, however, happy: *e.g.*, advertising and sales research hardly come under "design," nor do salesmen and advertising men practically belong under what either the layman or the average professional industrial engineer considers "operation." It would have been interesting if where he states that shareholders' liability for corporation debts is limited "except in two states" he had named these; because in California, Florida, Kentucky, Michigan and New Hampshire there are strings, tied to the limitation, and the Philippines have no legislation on the subject.

The diagrammatic illustrations of circulation of capital, etc., are excellently planned. The paragraph on seasonal sales is interesting, as are those on manufacturers' cooperation in lending labor in dull seasons. Diagrams 13 and 17, concerning stock control, are much more educative than mere text.

Under "cranes," that most useful class, the walking crane, is not mentioned, and apparently the overhead crane is of only one general type. The question of one, two or three crane motors is so important as to call for discussion; the crane scale would be worth a line, and the "piling machine" (tiering machine) several. Stress is laid on the so-called "straight line" layout; whereas it is immaterial whether the flow be straight or crooked, so long as there are few skips, stops, kinks or back-hauls.

The element of fatigue as related to output is touched upon and illustrated by curves; but the methods of reducing or preventing excess fatigue (every worker should experience fatigue, else he is doing nothing) are left untouched.

Under "purchasing" there are useful hints, illustrated by curves, but which the type of "P. A.," who knows that 99 cents is less than \$1, will probably never see, and surely never heed. The purchaser, who has copyrighted the *o* in his title, will be more apt to. As far as I know Dutton is the only author who emphasizes the fact that preparation and carrying charges should be included in material cost, and that they act uniformly and oppositely. Standardization and budgeting of purchases get a good paragraph, but should have had more concrete material.

Stores are handled admirably, and under "pricing" there is a priceless phrase: "Sound accounting practice dictates that for inventory purposes materials shall be priced at 'cost or market, whichever is lower,' the theory being that profits are not to be anticipated, but losses are." (Foundrymen and dress manufacturers please take notice of this; also of the Franklin assembly diagram and schedule board, pages 170, 171.)

The paragraph on decentralization, page 188, should enable cutting a good deal of unnecessary red tape.

Chapter XIII, with its "flow repetitive" and other plans, is not very precise in its explanations, although very full and concrete.

Under "accounting and costs" the author has coined a good expression for such goods as are made actually at a loss—"parasitic lines"—but he might have extended the application of the adjective to departments, sales districts, salesmen, and workers; for almost, if not every manufactory, has these, the losses on which

(or on whom) are carried (sometimes masked) by others.

The expression "collecting costs" could be improved, as it might imply only after-costing, whereas forecasting, which enabled safe and sane estimating and bidding before production, calls for allocation of costs possibly to be incurred, but which cannot be "collected," because not yet existing. I mention this not in a cavilling spirit, but to emphasize the fact that there is too little correct fore-costing existing, partly, to be sure, because there has been too little correct after-costing.

Under "depreciation" the author commits the error of most writers and of cost accountants, of either omitting the little trifle of providing a depreciation reserve to replace the wornout asset, the value of which has really entered into the product, or setting aside too much. Goldman, I believe, was the first to point out that the depreciation rate usually assumed for reserves is much too high; for instance, in a building with life assumed as 50 years, it is not, at 6 per cent interest, the 2 per cent usually reckoned, but only 0.34 per cent; giving an error of some 600 per cent (0.06, divided by 1 less than the fiftieth power of 1.06, equals 0.34).

The importance of inspection is pointed out, but only at the inspector's crib; whereas step-by-step inspection by piece workers is often by far more effective in preventing further work on spoiled or defective pieces than any by regularly appointed inspectors. The operator who knows that he will not only not get paid for work done on spoiled pieces, but perhaps be penalized as well, will say "nothing doing," and drop them back in the tote-box.

Functional foremanship is well shown in a modified form, as well as that by the Taylor method. The personnel department is given proper notice.

Gang bonus receives due attention, which most writers do not pay. The so-called living wage is not mentioned, because it means nothing—or any old thing. The minimum wage proposition, which would throw all incompetents into the street, might have been scored, as it deserves. Apparently, also, there are no labor unions; as they are not mentioned, except on page 130, that labor "objects to time-study," and incidentally, on page 276, under "collective bargaining." Howard R. Heydon, when secretary of the New Jersey State Chamber of Commerce, pointed out that there are not merely two kinds of shops, "open" and "closed," but eight, including the "open-closed" and the "closed-open" shop, or something like that; and Professor Dutton would have served the community well by going into this subject. But he has given us a worth-while book.

ROBERT GRIMSHAW.

Non-Ferrous Metals and Other Minerals. (Resources of the Empire Series.) Edited by N. M. Penzer, F.R.G.S., etc., with a foreword by the Prince of Wales, and general introductions by Sir Eric Geddes and Sir Richard Redmayne. Pages 264, 7½ x 10¼ in. Published by Ernest Benn, Ltd., London. Price, 21s., plus duty.

This work, to which perhaps Redmayne's name gives the most weight, is pure statistics. The first part consists of a short introduction to every mineral considered, alphabetically arranged and bearing a distinct number throughout the work. The second, forming the bulk of the book, deals with each British possession geographically, while the third is a most valuable bibliography arranged under the alphabetical list of minerals. The work has been compiled with the assistance of the Imperial Mineral Resources Bureau, which accorded the editors much hitherto unpublished material.

Naturally, the interest for Americans lies in information as to sources of supply. For instance: we see at once that antimony is to be found in South Africa, Canada and India, and especially, in Australia, of the British possessions; also in France, Italy, Spain, Algeria, Mexico, the United States, Peru, Bolivia, China and Japan; these last in the greatest quantities.

In some matters the work is not up to Penzer and Redmayne standard; for instance, about cement (not

that cement is a mineral, but it is listed as such, while steel and brass are not). Apparently there is only one way to make so-called "Portland" cement, and only one kind, in the British possessions; whereas, so-called slag cement and "montan-cement" (which is made from blast-furnace slag as a chemical component and not a

mere mechanical mixture) are important factors in modern concrete construction.

The 5¼-in. long unleaded type line is inexcusable in these days, as we are now taught to read "by the eye-ful," instead of as formerly, piecemeal. But the book is an excellent addition to the reference library.

EXPORT BUSINESS BETTER

Recent Sheet Orders Taken at Low Prices—Japan Buys Rails in Europe—Active Demand for Pipe

NEW YORK, July 15.—Trade with Japan continues to show considerable improvement but there is still but little activity on the part of the small merchants. Present business seems to be largely from Government or municipal sources. In the Chinese market, quietness is unbroken, except for minor inquiries for usual requirements. One request for prices on pipe has attracted the attention of mills. The inquiry calls for 230 tons, 200 tons of steel and 30 tons of wrought iron. Competition among the American bidders is said to have been keen, but award has not yet been made.

Purchases and inquiries for pipe have been a feature of the export market lately. In addition to the 85 miles of 6-in. line pipe bought by the Standard Oil Co., for Palembang, Dutch East Indies, it is persistently rumored that purchases are contemplated by the same company for development in Venezuela. There is an inquiry of the International Petroleum Co. and a subsidiary, the Andean National Corporation, for about 35,000 tons of pipe, and an inquiry from Colombia is said to call for about 200 miles. There is the older tender of the Argentine Government oil fields for 20,000 tons of oil well casing.

The outstanding export rail inquiry of a week ago was the tender of the Imperial Government Railways of Japan on 10,000 tons of 60 and 75-lb. sections and accessories. While the Japanese state railroads have usually placed orders for rails in the United States, this lot is understood to have gone to a European mill, probably in France, at a price quoted in pounds sterling which represented \$34.56 per ton, c.i.f. Japan. The lowest American quotation is understood to have been \$40 per ton, c.i.f. Japanese port. A tender for 850 tons of tie plates for these rails is now on the market.

Some purchasing of rails by Japanese municipalities, however, has been done in the United States. The 6½ miles of 100-lb. high T rails for the Keh-Hin Electric Railway was awarded to Mitsui & Co., New York and the 12 miles of 91-lb. high T and 4 miles of 92-lb. grooved rails for the Tokio Electric Railway was awarded to Mitsubishi Shoji Kaisha, New York. The awarding of 2½ miles of 92-lb. grooved rails for the Kyoto Electric Railway was postponed a third time and bids opened July 15.

Among purchases of railroad material other than rails, the 4000 boiler tubes asked for some time ago by the South Manchuria Railway Co., have not been awarded, but the 8200 tons of brass condenser tubes are claimed in some quarters to have been placed with a Japanese mill and by others to be still pending. A tender on 5950 boiler tubes, issued by the Korean State Railways was placed with Mitsui & Co. A tender which is attracting some attention among exporters is from the municipality of Osaka and specifies 5600 tons of plates, bars, channels, bolts, nuts and rivets—bridge material which will be fabricated in Japan. Bids will not be opened until August.

Probably a large part of the Japanese business recently placed in the United States was light gage black sheets, 13 and 27 to the bundle. The two foremost export interests in this country, apparently desirous of obtaining a small backlog of sheet business reduced quotations on black sheets drastically. The majority of this business is understood to have gone on a descending scale from \$87 per ton, c.i.f. Japan, to as low as \$81 per ton. The British market is said to have been forced down by these concessions to as low as \$79

per ton. Following the booking of a fairly large tonnage, both these sellers have returned to higher prices, and the average small merchant inquiry from Japan, which followed in the wake of this sudden activity, obtains but little concession from the established price.

The tin plate inquiry of the Japanese army for 5570 boxes of canners tin plate will be opened July 22. In view of the reported price at which the 13,000 boxes of oil can tin plate for the Kioto Oil Co. was placed, said to have been about \$5.65 per box, c.i.f. Japan, similar concession is expected on the army tender.

Scarcity of tonnage for shipment to the Far East, which was not as pronounced last spring, was evidently the cause of retention of the old ocean freight rates on most products, instead of an increase from \$8 to \$10 per ton, as announced by the steamship companies. Beams, sheet steel piling and structural material, except angles, are the only products on which the advance to \$10 per ton has been applied. The only other reported advance is the extra charge of 50c. per ton on shipments to Shanghai, China, an increase to cover port charges, formerly absorbed by the shipping companies.

Sheet Output Still Lower in June

PITTSBURGH, July 15.—June was another month of decreasing activity for independent manufacturers of sheets. The monthly report of the National Association of Sheet and Tin Plate Manufacturers discloses that sales for June were only 38.7 per cent of capacity, against 42.7 in May and 61.8 in April. June production was only 40.9 per cent of capacity, almost 19 per cent below May and over 39 per cent below April. Shipments in June were equal to 50.2 per cent of capacity, against 66.2 in May and 79.7 in April.

Sales for the quarter ending with June totaled 418,083 tons; production 525,389 tons and shipments 573,397 tons. Unfilled orders at the end of June amounted to 246,810 tons; at the beginning of the quarter they were 422,889 tons.

June figures compare with these for May and April in net tons as follows:

	June	May	April
Capacity	395,800	419,000	413,000
Sales	108,693	126,487	182,903
Production	114,807	176,582	234,000
Shipments	141,176	196,254	235,967
Unfilled orders	246,810	294,774	362,457
Unshipped stocks	82,466	89,548	92,629
Unsold stocks	46,776	43,319	48,945
Per cent reporting	71.0	76.7	71.7

Valley Scrap Market Advances

YOUNGSTOWN, July 15.—Sale of a round tonnage of heavy melting scrap has been made in this district at \$18, which is up 50c. per ton from the last previous transaction. Melters are making some scrap purchases, but still doing so in a cautious way. Hydraulically compressed sheets are quotable at \$16, an advance of 50c. per ton. The scrap market is receiving some impetus from improved buying in finished steel lines, and dealers are more optimistic.

The Blanchard Machine Co. Cambridge, Mass., will close its shop and office at noon Saturday, July 26, for two weeks, reopening Monday, Aug. 11. Most of the employees will take their vacations during that period, a small force being on hand to answer inquiries, do repairing and take care of urgent matters.

European Dullness Rather Pronounced

Operations in Ruhr Barely 30 Per Cent—British Pig Iron
Weaker—Inquiry for Finished Products Somewhat
Better—South America in Sheet Market

(By Cable)

LONDON, ENGLAND, July 15.

PIG IRON improvement has not been maintained. The market now shows a weaker tendency. Export buying is poor and home consumers are limiting purchases to urgent requirements. Scotland incidentally is preparing for annual holidays.

Hematite is dull but some small lines have been sold for Italian account. Cochrane & Co. and Dorman, Long & Co. have each blown in one furnace for own steel works requirements.

Foreign ore also is dull. Bilbao Rubio ore is nominally 22s. 6d. to 22s. 9d. (\$4.87 to \$4.93) c.i.f. tees.

Finished steel inquiry is better but business remains dull, owing to the reluctance of makers to grant concessions. Instead finished prices are stiffening on increasing costs.

Pig iron exports in June amounted to 40,792 tons, of which the United States took 1085, against 5355 tons in May. Total exports of iron and steel were 324,432 tons, against 406,919 tons in May and 336,799 tons in April.

The Armstrong Works secured a contract involving £1,000,000 for the New Zealand Government Arapuni hydroelectric scheme.

The Continental position is still complex. Merchant bars are weak, having sold for £7, cost and freight.

India makers are apparently wanting orders, but buyers generally are not keen.

German wire rods sold for £7, 15s., f.o.b.

In the Ruhr the steel industry averages a scale of operations of barely 30 per cent. Krupp is introducing short time work, discharging 5 per cent of the personnel. The Phoenix company at Ruhrort stopped two new rolling mills. Maximilianshütte is curtailing at the mines and blast furnaces in Thuringia.

In Luxemburg 36 furnaces are blowing out of a total of 47.

An improved demand for tin plates, mainly at home is noted. Export sales are fair, all business being on a basis of 22s. 7½d., f.o.b.

Galvanized sheets are strong, South America negotiating for a heavy tonnage for September-October shipment. Other market demands are moderate. Black sheets are quiet and prices are unchanged.

BELGIAN MARKET SLOW

Keen Competition from Luxemburg and Lorraine
—Buying by India

BRUSSELS, BELGIUM, July 4.—The Belgian iron and steel market is stationary. The volume of orders remains small and quotations show a downward tendency.

Competition of the Luxemburg and Lorraine plants is keen. Until recent weeks Belgian producers had the advantage of being allowed special tariffs by the railroads on finished products, partly setting off increased costs due to the transportation of the Lorraine and Luxemburg ores to the plants. But now the Luxemburg plants enjoy the same rates.

The only noticeable feature of the week was the renewal of the demand from India, but generally with appreciable price concessions. Beams were sold on the basis of £6 5s. (594 Belgian francs), while bars were valued £6 7s. 6d. (606 Belgian francs). At the date of writing \$1 = 22.22½ fr., £1 = 95 fr.; 1 French franc = 1.139 Belgian francs.

Pig Iron.—The rise in the price of Lorraine ores of 6 to 7 fr. per ton represents an increase of 20 to 27.5 fr. per ton in the price of pig iron. On the other hand, the rates of German coke were reduced from 153 to 146 fr. per ton, which will inevitably bring a proportional decrease in the price of Belgian coke. Competition remains active. Chill cast iron No. 3 is quoted at 405 to 410 Belgian fr.; the Luxemburg corresponding

British and Continental prices per gross ton, except where otherwise stated, f.o.b. makers' works, with American equivalent figured at \$4.34 per £1, as follows:

Durham coke, delivered	£1 7½s.	\$5.97
Bilbao Rubio ore†	1 4	5.21
Cleveland No. 1 foundry	4 13 to £4 13½s.	20.18 to \$20.29
Cleveland No. 3 foundry	4 8½	19.21
Cleveland No. 4 foundry	4 7 to 4 7½	18.88 to 18.99
Cleveland No. 4 forge..	4 6 to 4 6½	18.66 to 18.77
Cleveland basic	4 6½	18.77
East Coast mixed	4 16 to 4 16½	20.83 to 20.94
East Coast hematite...	4 19 to 5 0	21.48 to 21.70
Ferromanganese	17 0 and 16 10*	73.78 and 71.61*
Rails, 60 lb. and up...	8 10 to 9 0	36.89 to 39.06
Billets	7 15 to 8 5	33.63 to 35.80
Sheet and tin plate bars,		
Welsh	8 12½	37.43
Tin plates, base box...	1 2½ to 1 2½	4.91 to 4.96
Ship plates	9 5 to 9 15	1.79 to 1.89
Boiler plates	13 0 to 13 10	2.52 to 2.61
Tees	9 7½ to 9 17½	1.81 to 1.91
Channels	8 12½ to 9 2½	1.67 to 1.77
Beams	8 7½ to 8 17½	1.62 to 1.72
Round bars, ¾ to 3 in.	9 15 to 10 5	1.89 to 1.98
Galvanized sheets, 24 g.	18 5 to 18 10	3.53 to 3.58
Black sheets, 24 gage..	13 5	2.57
Black sheets, Japanese		
specifications	15 5	2.95
Steel hoops	10 15 and 12 10*	2.08 and 2.42*
Cold rolled steel strip,		
20 gage	17 0	3.29

*Export price. †Ex-ship, Tees, nominal.

Continental Prices, All F. O. B. Channel Ports

(Nominal)			
Foundry pig iron:			
Belgium	£4 2½s. to £4 5s.	\$17.90 to \$18.44	
France	4 2½ to 4 5	17.90 to 18.44	
Luxemburg	4 2½ to 4 5	17.90 to 18.44	
Billets:			
Belgium	5 17½	25.50	
France	5 17½	25.50	
Merchant bars:			
Belgium	6 7½	1.23	C. per Lb.
Luxemburg	6 7½	1.23	
France	6 7½	1.23	
Joists (beams):			
Belgium	6 7½	1.23	
Luxemburg	6 7½	1.23	
France	6 7½	1.23	
Angles:			
Belgium	8 0 to 8 5	1.55 to 1.60	
½-in. plates:			
Belgium	7 17½	1.52	
Germany	7 17½	1.52	
¾-in. plates:			
Luxemburg	7 17½	1.52	
Belgium	7 17½	1.52	

grades are 400 to 410 and the Lorraine similar grade 410 to 415, f.o.b. Antwerp.

Semi-Finished Material.—Due to the small number of plants taking orders, prices are irregular and fluctuate from one plant to the other. In basic steel, blooms are 520 to 530 fr.; billets, 560 to 570 fr.; with the Luxemburg and Lorraine products, 5 to 10 fr. higher.

Rolled Iron.—The cost of production being too high, prices remain unsteady and range from 590 to 625, and even 650 fr., f.o.b., for No. 3.

Bars, Beams, Etc.—Trade is dull except for orders for India. The few dealings recorded are made at low prices. For export, the quotations are £6 5s. to £6 7s. 6d. for beams and £6 7s. 6d. to £6 10s. for bars. The corresponding domestic prices are: 590 to 600 fr. for beams, 600 to 610 fr. for bars, 730 to 740 fr. for rods, 900 to 910 fr. for hoops, and 1250 fr. for cold-rolled hoops. Luxemburg plants are submitting like prices for beams and bars, while the Lorraine plants are out of the market, their prices being too high.

Sheets.—Plants have large commitments. For export quotations are high if compared with the German rates, which stand between £7 10s. for heavy grades and £7 12s. 6d. to £7 15s. for assorted grades. Domestic prices for basic steel are as follows:

	Fr.
5 mm. and over.....	730 to 740
3 mm.	800 to 825
2 mm.	860 to 875
Lighter grades	950 to 1,350

Production.—The number of furnaces in blast in May was 47, as also in April. The production of pig iron amounted to 246,520 tons in May, as compared with 239,530 tons in April. The output of steel ingots was 243,540 tons in May, as against 233,630 tons in April. In May the production of finished products was: in castings, 6980 tons (7110 tons in April); finished steel, 203,700 tons (195,670 tons in April); finished rolled iron, 17,120 tons (18,970 tons in April).

More Buying and Increased Mill Activity at Youngstown

YOUNGSTOWN, July 15.—District iron and steel interests believe betterment in buying is of a sustained nature, and schedules this week are on a broader basis than for two months. The Trumbull-Cliffs Furnace Co. has placed its 600-ton blast furnace at Warren on the active list after three months' idleness. The company's recently completed by-product coke oven plant is operating at normal.

Of 52 independent open-hearth furnaces, 17 are melting this week, 53 of 119 sheet mills are rolling and ten of 17 tube mills. The sheet mill schedule is the best in several months. Pipe business is coming forward in larger volume, in both lapweld and butt weld sizes, and shipments are being maintained in satisfactory volume. The Truscon Steel Co., is operating at a capacity rate. This week the Trumbull Steel Co. at Warren, is operating 29 of 34 sheet and tin plate mills, including two jobbing mills.

Sale of Mechanical Stokers

WASHINGTON, July 15.—Mechanical stokers to the number of 102, representing 35,549 hp. were sold in June by 15 establishments reporting to the Department of Commerce, as against 64 of 34,447 hp. sold by the same number of establishments in May.

Meridian Determination is covered in a technical bulletin of the School of Mines and Metallurgy of the University of Missouri, just issued. The work was carried out by measurements of the horizontal angle between two stars and represents a thesis submitted for the degree of master of science by Prof. Clarence E. Bardsley. The bulletin, giving the determinations in great detail, covers about 200 pages.

Large Bridge-Building Program

Within the next year it is expected that construction work will be under way on three large bridges spanning the Ohio River at Portsmouth, Ohio, Cincinnati, and Evansville, Ind. The bridge at Portsmouth will be financed by the citizens of that city, and a bridge similar to the one between Ironton, Ohio, and Russell, Ky., will be erected. The Portsmouth-Fullerton Bridge Co., with a capitalization of \$300,000, has been incorporated in Ohio for the purpose of erecting the bridge. It is expected that work on this structure will be commenced this summer.

The bridge at Cincinnati will be constructed by the Chesapeake & Ohio Railroad. Surveys for this structure are now about completed. This bridge is to be built in the East End of the city and will connect the C. & O. directly with the Pennsylvania Railroad, and will facilitate the movement of coal cars from the former road to the latter for shipment north, east and west.

The Evansville bridge will be erected jointly by the States of Kentucky and Indiana and will be a Federal aid project. Congress has approved the building of the structure and has appropriated the necessary money for it. The State of Indiana has also approved the building of the bridge, and at the fall session of the Kentucky Legislature it is a certainty that the necessary authority will be granted for the State's share of the cost of the structure.

General Electric Co. Gets Large Sub-Station Contract

The largest order for automatic sub-station equipment ever placed in the United States has been placed by the Department of Street Railways, Detroit, with the General Electric Co. It calls for a total of 10 2000-kw. and four 1000-kw. single unit stations, aggregating 24,000-kw. Both semi-outdoor and indoor type sub-stations are to be used, but all of the transformers are to be of the outdoor type. The equipment includes standard 2000-kw. synchronous converters for 10 of the stations and standard 1000-kw. machines for the other four. It also includes high reactance type oil-cooled, single phase transformers with 24,000-volt primary automatic switching equipment, outdoor type outside film lightning arresters, oil circuit breakers for the incoming lines and high speed circuit breakers for the protection of each station. The converters will be equipped with standard General Electric flash barriers and the stations are to be fully automatic, including reclosing feeders. Delivery is extended to October, 1926.

Austrian Exports to Russia

WASHINGTON, July 15.—The Russian Minister in Vienna, in a recent statement which has been received by the Department of Commerce from the American Trade Commissioner in that city, said that economic relations between the Union of the Soviet Republics and Austria are rapidly improving. Austrian agricultural machinery, milling equipment, machinery, tools, and steel, according to the report, constitute an important part of the exports from Austria to Russia. The total value of all exports for the seven month period ending with May, 1924, amounted to \$1,200,000, in orders placed by the official Soviet trade delegation, and \$1,050,000 ordered in Vienna by semi-official Russian organizations known as "Ratac" and "Rusawatorg," two Austro-Russian trading firms.

Shipments of steel furniture in June were valued at \$1,270,615 as against \$1,505,367 in May, according to the Bureau of the Census, based on reports from 22 manufacturers. The June figures were the lowest since July, 1923, when shipments were valued at \$1,247,605.

Iron and Steel Markets

SLIGHT GAIN IN ORDERS

Operations Little Changed, but Prices of Some Products Tend Downward

Scrap Advance Attracts Attention—Export Demand for Pipe—Iron Ore Weaker

The encouraging feature of the steel market is a moderate increase in orders taken by the mills. Production is on no larger scale than before the shutdowns—at Chicago and in northern Ohio it is slightly less—and where prices have changed they have declined.

The larger amount of new business is due to needs accumulated while rolling mills were idle at the beginning of the month, and does not signify increased consumption. In some sections, in fact, consumption is less. The metal-working industries in the Cleveland district, for example, are now operating at about 35 per cent of capacity, as compared with 50 per cent late in June.

In no measurable degree has the situation in respect to railroad, structural or automobile demand shown a turn, except for a number of releases received by automobile parts makers on long-standing orders and the preparations of several car builders to begin production on new models.

New buying is better in sheets and bars than in most other products. But the sheet market is weaker, and bars are commonly sold at 2.20c., Chicago, with some sales there at 2.15c.

In line with the lower prices of sheets, business in sheet bars has been done at \$38 in the Central West, though the last contract price was \$40.

Cold-finished steel bars and shafting have declined \$2 a ton, and the 2.75c. price on hot-rolled flats has practically disappeared.

A reduction of \$5 a ton is announced on woven-wire fence, but at the same time the cash discount has been shortened. Barbed wire and staples have been reduced to a \$3.60 basis.

Over against these lower tendencies, there has been an advance in scrap for the past month, with larger buying of heavy melting steel this week at Youngstown. Since the scrap market at times has led in pointing to a turn, this development has been called favorable.

Midsummer building construction is fairly active, but with no new trend, awards of the past week requiring upward of 30,000 tons of steel, while inquiries on new work total about 22,000 tons, including 8300 tons for a power station in Philadelphia. In the holiday week the awards were 12,000 tons and in the previous week 31,000 tons.

Structural steel bookings in June were 12 per cent above those of May, a third over those of June of last year, and for the first half of this year 1,050,000 tons, or only 65,000 tons under the record made in the first half of 1923.

The pig iron market is showing greater firmness in some districts, notably at Ironton, Ohio, where 50c. higher is asked, but Bessemer iron has

declined 50c. at Pittsburgh. In the immediate Chicago district, \$19.50 to \$20, furnace, is still held, but Chicago iron is being sold in the St. Louis district at \$18, furnace.

A domestic maker of ferromanganese is offering to sell at \$105, seaboard, or \$2.50 below the price made for some time by both foreign and domestic producers.

Recent shading of prices of Lake Superior ores is attributed at Cleveland to small mining companies and not to leading producers. A pending inquiry for 200,000 tons from a furnace company may test the strength of the market.

The recent order of the Imperial Government Railways of Japan for 10,000 tons of 60 and 75-lb. rails is understood to have gone to a European mill at \$34.56 per ton, c.i.f. Japan, much below the American bid, though nearly all previous contracts came to this country. Japanese inquiry for light gage black sheets is active, following heavy purchasing here at considerable concessions, but domestic mills are not now willing to duplicate the low prices.

Inquiry for line pipe for South American and other foreign oil fields is active. The Standard Oil Co. has bought 85 miles of 6-in. pipe for the Dutch East Indies, and there is pending business for Venezuela.

In domestic orders an interesting item is the Pan-American Petroleum Co.'s purchase of 140 miles of 10-in. pipe for a line from Bakersfield, Cal., to its refinery.

European dullness has become rather pronounced and British pig iron prices are weak. Ruhr plants are operating at barely a 30 per cent rate. Galvanized sheets alone are strong and an inquiry for a large tonnage has appeared from South America.

THE IRON AGE composite prices are unchanged this week, that of pig iron remaining at \$19.29 per ton and that of leading finished steel products at 2.589c. per lb.

Pittsburgh

Steel Orders More Numerous, but Tonnages Booked Not Large

PITTSBURGH, July 15.—Steel business is better to the extent that orders are more numerous than they were recently in a number of products, but the individual bookings still are of small lots and the anxiety of manufacturers for even small orders is evident from the fact that prices in practically all instances have been favorable to the buyers. Possibly it is an encouraging sign that there is business at a price because very recently the idea was common that price concessions would not bring out business.

Some of the trade also derive encouragement from the strength of the scrap market. Heavy melting steel scrap has sold above \$18 in this district and is said to have sold at \$19 in the Youngstown district, where one steel company is credited with having taken between

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	July 15, 1924	July 8, 1924	June 17, 1924	July 17, 1923
No. 2X, Philadelphia...	\$21.26	\$21.26	\$21.26	\$27.56
No. 2, Valley furnace...	19.00	19.00	19.50	25.00
No. 2, Southern, Cin'tit...	22.05	22.05	24.05	29.05
No. 2, Birmingham, Ala.†...	18.00	18.00	20.00	25.00
No. 2 foundry, Chicago*	19.50	19.50	21.00	28.00
Basic, del'd, eastern Pa...	20.00	20.00	21.00	26.50
Basic, Valley furnace...	19.00	19.00	19.50	25.00
Valley Bessemer, del. P'gh	21.76	22.26	22.76	28.26
Malleable, Chicago*	19.50	19.50	21.00	28.00
Malleable, Valley	19.00	19.00	20.00	25.50
Gray forge, Pittsburgh...	20.26	20.26	21.26	26.26
L. S. charcoal, Chicago...	29.04	29.04	29.15	36.65
Ferromanganese, furnace.	105.00	107.50	107.50	117.50

Rails, Billets, Etc., Per Gross Ton:

	July 15, 1924	July 8, 1924	June 17, 1924	July 17, 1923
O.-h. rails, heavy, at mill.	\$43.00	\$43.00	\$43.00	\$43.00
Bess. billets, Pittsburgh...	38.00	38.00	38.00	42.50
O.-h. billets, Pittsburgh...	38.00	38.00	38.00	42.50
O.-h. sheet bars, P'gh...	38.00	40.00	40.00	42.50
Forging billets, base, P'gh	43.00	43.00	43.00	47.50
O.-h. billets, Phila...	43.17	43.17	43.17	47.67
Wire rods, Pittsburgh...	48.00	48.00	48.00	51.00
	Cents	Cents	Cents	Cents
Skelp, gr. steel, P'gh, lb...	2.15	2.15	2.20	2.40
Light rails at mill...	1.90	1.90	1.90	2.25

Finished Iron and Steel,

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia...	2.42	2.42	2.42	2.67
Iron bars, Chicago...	2.20	2.20	2.20	2.50
Steel bars, Pittsburgh...	2.15	2.15	2.20	2.40
Steel bars, Chicago...	2.20	2.20	2.25	2.60
Steel bars, New York...	2.49	2.49	2.54	2.74
Tank plates, Pittsburgh...	2.15	2.15	2.15	2.50
Tank plates, Chicago...	2.25	2.25	2.35	2.80
Tank plates, New York...	2.19	2.19	2.34	2.84
Beams, Pittsburgh...	2.15	2.15	2.20	2.50
Beams, Chicago...	2.25	2.25	2.35	2.70
Beams, New York...	2.34	2.34	2.44	2.84
Steel hoops, Pittsburgh...	2.60	2.75	2.75	3.15

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.
†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

Sheets, Nails and Wire,	July 15, 1924	July 8, 1924	June 17, 1924	July 17, 1923
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 28, P'gh	3.50	3.50	3.50	3.85
Sheets, galv., No. 28, P'gh	4.60	4.60	4.75	5.00
Sheets, blue, an't'd, 9 & 10	2.70	2.75	2.75	3.00
Wire nails, Pittsburgh...	2.90	2.90	2.90	3.00
Plain wire, Pittsburgh...	2.65	2.65	2.65	2.75
Barbed wire, galv., P'gh...	3.70	3.70	3.70	3.80
Tin plate, 100-lb. box, P'gh	\$5.50	\$5.50	\$5.50	\$5.50

Old Material, Per Gross Ton:

Carwheels, Chicago	\$16.50	\$16.50	\$15.50	\$20.50
Carwheels, Philadelphia...	17.50	17.00	17.00	20.00
Heavy steel scrap, P'gh...	18.00	17.00	16.00	18.00
Heavy steel scrap, Phila...	15.50	15.50	15.00	16.50
Heavy steel scrap, Ch'go...	15.50	14.50	13.50	17.00
No. 1 cast, Pittsburgh...	18.00	17.50	17.00	21.00
No. 1 cast, Philadelphia...	18.00	18.00	17.50	21.50
No. 1 cast, Ch'go (net ton)	17.00	16.75	16.50	19.00
No. 1 RR. wrot, Phila...	18.00	17.50	16.50	18.00
No. 1 RR. wrot, Ch'go (net)	13.00	12.50	11.50	14.50

Coke, Connellsville,

Per Net Ton at Oven:

Furnace coke, prompt...	\$3.00	\$3.00	\$3.25	\$4.50
Foundry coke, prompt...	4.25	4.25	4.50	5.25

Metals,

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York...	12.62½	12.50	12.75	15.00
Electrolytic copper, refinery	12.12½	12.00	12.37½	14.50
Zinc, St. Louis...	5.85	5.77½	5.85	6.12½
Zinc, New York...	6.15	6.12½	6.20	6.47½
Lead, St. Louis...	6.65	6.65	6.95	5.90
Lead, New York...	7.00	7.00	7.25	6.00
Tin (Straits), New York...	45.25	43.62½	44.75	38.00
Antimony (Asiatic), N. Y.	8.30	8.30	8.37½	6.85

Composite Price, July 15, 1924, Finished Steel, 2.589c. Per Lb.

Based on prices of steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets	July 8, 1924, 2.589c. June 17, 1924, 2.603c. July 17, 1923, 2.789c. 10-year pre-war average, 1.689c.
These products constitute 88 per cent of the United States output of finished steel	

Composite Price, July 15, 1924, Pig Iron, \$19.29 Per Gross Ton

Based on average of basic and foundry irons, the basic being Valley quotation, the foundry an average of Chicago, Philadelphia and Birmingham	July 8, 1924, \$19.29 June 17, 1924, 20.13 July 17, 1923, 25.93 10-year pre-war average, 15.72
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35,000 and 50,000 tons of three grades of old material. With activity also showing in scrap at Canton and Massillon, Ohio, there is a notion that better business is anticipated and with scrap prices only slightly below those of pig iron, there is introduced into the situation the possibility that the melt of pig iron will be increased and that this will check its weakness. The present rate of steel works operations offers no good reason for the activity and strength in the scrap market, but close market observers note that, in the past, scrap prices have often made a turn well in advance of one in either steel or pig iron prices.

In a general way, the steel plant activities in this and nearby districts are about the same as they have been recently. Slight increases are noted here and there, but these are founded on accumulations of business during the recent suspensions rather than upon a genuinely better demand.

Price changes of the past week in all instances have

been downward. In what is known as the Pittsburgh district, that area in which Pittsburgh mills have a freight advantage over outside producing centers, the market still is quotable at 2.15c., Pittsburgh, on the heavy tonnage products, but so little business is developing in that area that no real test of the price is afforded. It is probable that if any good sized inquiries came up, mills in this district would go close to, or actually to the prices they are naming in competitive territory. Cold-finished steel bars and shafting have dropped \$2 a ton since a week ago. There has been a reduction of \$5 a ton in the price of woven wire fence and also the admission that full quotations are not general on other wire products. Competition for sheet orders again has grown rather sharp, and minimum quotations are more commonly named. As a sales base, 2.75c. has practically disappeared on hot-rolled flats. On cold-rolled strips some makers are still quoting as high as 4.50c., but some have not stopped at 4.25c. to secure

a desirable order or to hold a customer. Still lower prices have appeared on bolts, with some makers quoting as low as 70 and 5 per cent off list on large inquiries for large machine bolts. The semi-finished steel market gives indications of working off with the appearance of any sizable inquiries.

New features are lacking in the pig iron market, which still is more favorable to buyers than sellers, as available supplies are pretty heavy. A couple of fair sized contracts for furnace coke have been made at \$3 per net ton at ovens, and the market appears to be fairly well established at that price on standard grade.

Pig Iron.—There has been no decided increase in the demand, and no change in prices, except in Bessemer iron, which has dropped 50c. a ton to \$20, Valley furnace. A local melter closed for 7050 tons at \$20, Johnstown, but also had quotations of the same price, f.o.b. Valley furnace, and a Valley furnace interest reports a sale of 3000 tons at \$20, furnace. Interest in basic iron is low, although a merchant producer claims to have disposed of several thousand tons at \$19.50, Valley furnace. In view of the fact that this grade is available at \$19, Valley furnace, or Johnstown, there is a tendency to believe that the higher priced transaction was on a non-competitive basis, or that the delivery extended to the fourth quarter of the year. Few producers would take fourth quarter business in any grade at today's prices. Only small lots of foundry iron are being sold and these at last week's prices. A local rolling mill and roll manufacturer has closed since a week ago for 1000 tons of low phosphorus iron at about \$28, delivered from an Eastern furnace. The Westinghouse Electric & Mfg. Co. is in the market for a small tonnage of Bessemer iron and the United Engineering & Foundry Co. would take on a tonnage of this grade provided the price was low enough. The week has brought a net gain of one blast furnace in the active list. Shenango Furnace Co., Sharpsville, Pa., has started its No. 1 furnace and the stack of the Trumbull-Cliffs Furnace, Warren, Ohio, went into blast last night. The Jones & Laughlin Steel Corporation has banked one of its Aliquippa furnaces.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh district being \$1.75 per gross ton:

Basic	\$19.00 to \$19.50
Bessemer	20.00 to 21.00
Gray forge	18.50 to 19.00
No. 2 foundry	19.00 to 19.50
No. 3 foundry	18.50 to 19.00
Malleable	19.00 to 19.50
Low phosphorus, copper free....	27.00 to 28.00

Ferroalloys.—The story this week is merely a repetition of that for several weeks past—little or no interest by consumers with prices untested and nominal. Fifty per cent ferrosilicon is quoted as high as \$75, delivered, but no sales are reported at that price, since some producers are quoting \$72. Prices are given on page 177.

Semi-finished Steel.—Business still is extremely slack with sales too few and small to establish a change in prices. Finished steel prices apparently have not reached a bottom and a slow demand is an additional reason for caution about purchases by the non-integrated units. They will not pay \$38 for billets or slabs because they claim they cannot afford to on present price of the principal finished products. Sheet makers cannot reconcile 3.50c. black sheets and \$40 sheet bars, and it is doubtful whether they are paying that price for current supplies. A northern Ohio maker is quoting \$38 Pittsburgh or Youngstown and that is probably nearer the real price today. It requires real sales effort to secure forging billet business at \$43 base. Skelp is untested at 2.15c. and wire rods are not moving with any considerable freedom at \$48 base. The Youngstown district this week shows some increase in ingot production, but the general average of steel works operations is probably below 35 per cent of capacity. Prices are given on page 177.

Iron and Steel Bars.—Local and Youngstown mills still claim to be holding to a base of 2.15c., Pittsburgh for soft steel bars and that they are obtaining that

price on such business as is coming out. There are no large inquiries, however, and a real test of the price has not been made. Consumers who buy on quarterly contracts, such as the cold-finished bar makers and manufacturers of bolts, nuts and rivets are not doing well enough to be free in their specifications and current bookings run entirely to small lots. Activity also is lacking in iron bars, but makers are holding to recent prices, chiefly because they do not believe business would be better at lower prices. Prices are given on page 176.

Structural Material.—Competition from outside mills has not yet been of a kind to force mills here to go below 2.15c., Pittsburgh, on large structural beams, for delivery in the area where freight rates are favorable to Pittsburgh mills. Some independent mills are going close to the prices of Eastern mills in the East and equalizing freight with Western mills, but it is the testimony of fabricating companies here that the Pittsburgh market is 2.15c. Only small jobs, however, are originating in this territory. Fabricating shops are doing fairly well, but chiefly on projects involving not over 300 tons. Plain material prices are given on page 176.

Plates.—The Pittsburgh market, that is the area within which mills here have a freight advantage over outside mills, still is 2.15c., base, Pittsburgh, but only a small amount of business is developing within that area and when going into competitive territories, as most companies find it necessary to do to secure business, the price is being made to fit local conditions. At least one independent has named 2c., Pittsburgh, in the East, but the Carnegie Steel Co. disclaims having departed from 2.15c., Pittsburgh, in any market. Riter-Conley Co. is low bidder on six barges, involving about 1000 tons of steel, mostly plates, bids for which were asked by the U. S. Engineers, St. Louis. Prices are given on page 176.

Wire Products.—Leading manufacturers have announced fall dating on woven wire fence, but coincidentally withdrew the special terms of discount announced last March on barbed wire, staples and other fence materials. These special terms found little, if any, favor with distributors and failed of their purpose to stimulate business. With the announcement of the fall datings, woven fence has been reduced \$5 per ton through an increase in the discount of 2½ points. Discount to jobbers now is 70 per cent off list and to retailers 67½ per cent. General business in wire products still is very slack and while some mills are running a little heavier this week than recently, the explanation is found in an accumulation of orders over the recent shutdown rather than in a genuine increase in the demand. Prices are irregular and it is probably true that practically as much business is being placed at concessions as at full prices. Coated nails still are weak. Prices are given on page 176.

Steel Rails.—Real activity still is lacking in light rails and for that reason prices are rather indeterminate. On billet rails, the most recent business was at 1.90c., base, and on rail steel rails from 1.65c. to 1.75c., mill, depending on destination and freight charges. No interest yet is apparent in standard rails by roads tributary to Pittsburgh. Any requirements for shipment over the remainder of the year will probably be tied up with 1925 orders. There are no intimations of lower prices, but both billets and structural steel are down materially in price from where they were when the present price of \$43 was named. It looks, moreover, as if the mills would be in need of orders to keep them busy during the winter.

We quote light rails, rolled from billets, 1.90c. base (25-lb. to 45-lb.); rolled from rail steel, 1.65c. to 1.75c. base (12-lb. to 45-lb.), f.o.b. mill; standard rails, \$43 per gross ton mill, for Bessemer and open-hearth sections.

Sheets.—Business has increased, but generally at the expense of prices. Minimum quotations, or 3.50c. for black, 4.60c. for galvanized and 2.70c. for blue annealed, have been named by more of the independent manufacturers than was the case recently. The Amer-

ican Sheet & Tin Plate Co. is still holding to prices \$2 to \$3 a ton above these levels and claims to be getting a fair run of orders at these figures. This company has taken on 6000 tons more of light gage sheets for shipment to Japan, its total bookings now amounting to 11,000 tons. Much of this business will be rolled on the larger tin plate mills. Prices are given on page 176.

Tin Plate.—Container manufacturers are taking out tonnages on contracts and also are drawing on stocks stored for their accounts fairly freely, but new business still is very slack and mill operations remain down around 50 per cent of capacity. There is no change in the domestic price, and not enough business to test it.

Hot-Rolled Flats.—While some makers still are quoting the narrow light gage material at 2.75c. base, Pittsburgh, the more common maximum now is 2.60c. on all gages and widths and on wide strips 2.50c. is common. Business shows some improvement, but it is in the number rather than in the size of the orders. Prices are given on page 176.

Cold-Rolled Strips.—Some attempt still is being made to preserve 4.50c. base, Pittsburgh, as the market, but an increasing number of makers are going as low as 4.25c. base, and it is reported that even the latter price has been shaded where a fair-sized tonnage was involved. Capacity is large for current demands and competition naturally is sharp.

Bolts, Nuts and Rivets.—There has been no improvement in business and prices continue to reflect the anxiety of manufacturers for orders. Some manufacturers have a public list quoting the large machine bolts at 65 and 10, but cases are known where 70 and 5 per cent off list have been named to secure a desirable order. Prices and discounts are given on page 176.

Tubular Goods.—Makers of steel pipe are operating at about 60 per cent of capacity; this is a fair picture of the present market, since it is believed that none of the present production is for stock, all makers having built up their stocks and then curtailed production when the demand decreased. By comparison with other lines, pipe is good, but manufacturers are not so crowded that they cannot take on more business and make very prompt delivery. Standard pipe is doing better than oil country pipe, because the weakness of oil is causing a curtailment of drilling, while good weather has permitted house and building construction to go ahead to an extent that jobbers have pretty well reduced their stocks and now are more frequent buyers of assorted sizes to round out depletions. Line pipe business partly is compensating for the lack of oil well pipe orders. Standard Oil companies are doing considerable quiet buying of line pipe and an order for 100 miles of 6-in. for export recently placed with a Youngstown mill is believed to have been for one of these companies. Wrought iron pipe is doing fairly well in standard grade. Boiler tubes still are weak, despite the fact that several producers of lapwelded steel and charcoal iron tubes have practically withdrawn from the market. Frequent suggestions of a drop in pipe prices have not materialized. Discounts are given on page 176.

Cold-Finished Steel Bars and Shafting.—Leading makers of rolled and drawn bars have reduced prices \$2 per ton to a base of 2.80c., Pittsburgh, for carloads and 3.05c. for less than carloads. Turned and polished bars and shafting, ordinarily held at an advance over base of \$2 a ton, now are priced at 2.80c., base, also. Ground shafting holds at 3.30c., base, f.o.b. mill, for carloads; the differential, therefore, is now \$10 per ton over rolled or drawn bars, as against \$8 formerly. The decline in rolled and drawn bars comes as a result of a slow demand and the lower prices of hot-rolled bars. Prices are given on page 176.

Track Supplies.—Interest in the market by the railroads is slight, as usual at this time of the year. Prices are based on small lots and really are untested. New extras on spikes have been generally adopted, but application is slight because of the limited amount of business. Prices are given on page 176.

Coke and Coal.—Coke prices are holding fairly well at above last week's levels. A Valley steel maker operating one blast furnace closed for about 40,000 tons for delivery over the remainder of this quarter at \$3 per net ton at oven, and the same price was paid by a Valley merchant furnace. Stray lots of spot furnace coke can be picked up at below \$3 at ovens, but in a general way that price is the prevailing one on standard coke. Foundry grade appears to be in better demand, and no good coke now is available at less than \$4.25 per net ton at ovens, while choice brands are bringing up to \$4.75. Absence of orders for lump coal has created some shortage of slack grade, prices of which are slightly firmer with steam slack commanding \$1.25 per net ton at mines and gas slack \$1.25 to \$1.40. Mine run steam and coking coal still ranges from \$1.50 to \$1.75 and mine run gas coal remains at \$2 per net ton at mines.

Old Material.—In the past week one local consumer bought a small tonnage of heavy melting steel at \$17.25 and another subsequently bought about 1500 tons paying \$18 and \$18.25 for equal quantities. None of this grade now is available at less than \$18 here and the activity and strength of markets to the west of Pittsburgh indicate further advances here if there should be any buying by local consumers. One Youngstown interest is reported to have taken from 35,000 to 50,000 tons of scrap, paying \$18.50 for heavy melting grade, \$16 for compressed sheets and \$15 for blast furnace material, while another company in the same district is said to have paid \$19 for heavy melting steel and \$16.50 for compressed sheet scrap. Massillon again has been a buyer, paying \$18.50 for 12,000 tons of heavy melting grade, while Canton has bought a round tonnage at \$18. The strength of this market is due more to the upward tendency in other districts than to local buying; actually, all of the important consumers here are out of the market and seemingly want to be convinced that the strength elsewhere is founded on improvement in the finished steel market before joining in the movement. Current offerings of scrap are light and dealers are not letting go of their yard stocks, since prices are not high enough to give them a profit. Scrap, however, is practically at a par with pig iron and there is a possibility of an increase in the use of pig iron in the furnace charge. If scrap prices reflect betterment in the steel market, they are doing so well in advance of orders, which are not materially heavier than they have been. Increased steel plant operations are based on accumulated orders rather than a real increase in demand. The Norfolk & Western Railway is taking bids until noon, July 18, on 5021 gross tons of scrap, a small list by comparison with last month.

We quote for delivery to consumers' mills in the Pittsburgh and other districts taking the Pittsburgh freight rate as follows:

Per Gross Ton	
Heavy melting steel.....	\$18.00 to \$18.25
No. 1 cast, cupola size.....	18.00 to 18.50
Rails for rolling, Newark and Cambridge, Ohio; Cumberland, Md.; Huntington, W. Va., and Franklin, Pa.	19.00 to 19.50
Compressed sheet steel.....	15.50 to 16.00
Bundled sheets, sides and ends..	14.00 to 14.50
Railroad knuckles and couplers..	20.00 to 20.50
Railroad coil and leaf springs..	20.00 to 20.50
Low phosphorus blooms and bil- let ends	21.50 to 22.00
Low phosphorus plate and other material	20.50 to 21.00
Railroad malleable	16.00 to 16.50
Steel car axles	20.00 to 20.50
Cast iron wheels	17.00 to 17.50
Rolled steel wheels	20.00 to 20.50
Machine shop turnings	12.50 to 14.00
Sheet bar crops	18.00 to 18.50
Heavy steel axle turnings	15.00 to 15.50
Short shoveling turnings	13.50 to 14.00
Heavy breakable cast	15.00 to 15.50
Stove plate	13.50 to 14.00
Cast iron borings	13.50 to 14.00
No. 1 railroad wrought	15.00 to 15.50
No. 2 railroad wrought	18.00 to 18.25

The St. Louis Coke & Iron Co. on July 20 will discontinue operating the Mississippi Valley Iron Co. stack which it has been operating under lease.

Chicago

Some Encouraging Signs—Releases Received by Automobile Parts Makers

CHICAGO, July 15.—The steel market is not without some encouraging indications, but convincing evidence that a turn is at hand is still lacking. Inquiry for some commodities, such as sheets and soft steel bars, is measurably better, and it is regarded as significant that important warehouse interests are sounding the market. Automobile parts makers have received a number of releases against orders of long standing, and some of the leading motor car builders have made substantial progress in reducing their stocks of finished machines and are preparing to go into production on new models. Other automobile manufacturers, however, do not intend to go back onto a production basis, but hereafter will build against orders only. Fabricating awards for the week bulk large and fresh inquiries are in substantial volume.

Actual mill bookings, on the other hand, show little betterment and prices are as weak as ever. Shading is common on practically all products and on sheets new low prices have been reported. Soft steel bars are more generally available at 2.20c., Chicago, and some tonnage has moved at 2.15c. Plates are exceedingly soft as indicated by quotations of as low as 2c. for delivery in sections like the Southwest, which are outside the territory where freight rates are favorable to Chicago. If demand is expanding, it has not yet affected production, which has lost further ground. Through the blowing out of a blast furnace at Gary, the number of active steel works stacks in this district is now only 15 out of a total of 34. Mill operations probably average 40 to 45 per cent, although one important interest is down to 38 per cent of capacity. With the blowing out of a Federal furnace, only one merchant stack, a furnace at Mayville, Wis., remains in operation in the Chicago, Milwaukee and Duluth districts. This brings output to the lowest point since 1921, when all merchant furnaces were idle for a time.

Those who regard the scrap market as a forecaster of business in finished commodities find encouragement in the uninterrupted advances during the past month. Heavy melting steel is now \$2 higher than when it struck the low point five weeks ago.

Ferroalloys.—A local buyer has closed for 300 tons of ferromanganese at the full market. Another attractive inquiry for ferromanganese is still pending.

We quote 80 per cent ferromanganese, \$115.06, delivered; 50 per cent ferrosilicon, \$75, delivered; spiegeleisen, 18 to 22 per cent, \$41.56 to \$42.56, delivered.

Pig Iron.—In a quiet market prices have undergone no particular change. On some of the small tonnages bought during the week efforts of sellers to obtain a minimum of \$20 base, Chicago furnace, have been rewarded with success. The sharp reduction in merchant iron production has doubtless strengthened the position of sellers. The blowing out of a Federal furnace leaves only one strictly merchant stack, a furnace at Mayville, in operation in the Chicago, Milwaukee and Duluth districts. Curtailment in output has removed the incentive to cut prices in order to keep furnaces going, and as stocks remaining on furnace yards are reduced, the attitude of sellers is expected to gain further strength. For the present, however, \$19.50, base local furnace, has not disappeared as a going price and at distant points where competition of outside producing centers has to be met, less than that is still being done. Most pending inquiries are small, although spot demand for one or two carload lots is quickening. One large melter is in the market for 500 to 1000 tons of malleable and 500 tons of foundry, but with this exception inquiries rarely exceed a few hundred tons. Charcoal appears to be firm at \$26 furnace as evidenced by a sale of 300 tons

in Wisconsin at that price. Seven out of the 10 charcoal furnaces in the Upper Great Lakes Region are in blast and stocks on furnace yards are not excessive. A few small sales of silvery indicate weakness in that commodity. A local melter has closed for 500 tons of low phosphorus. Electric ferrosilicon, 14 to 16 per cent, has declined \$1.

Quotations on Northern foundry, high phosphorus, malleable and basic iron are f.o.b. local furnaces and do not include an average switching charge of 61c. per ton. Other prices are for iron delivered at consumers' yards or, when so indicated, f.o.b. furnace other than local.

Lake Superior charcoal, averaging sil. 1.50, delivered at Chicago..	\$29.04
Northern coke, No. 1 sil. 2.25 to 2.75	\$20.00 to 20.50
Northern coke, foundry, No. 2, sil. 1.75 to 2.25	19.50 to 20.00
Malleable, not over 2.25 sil.....	19.50 to 20.00
Basic	19.50 to 20.00
High phosphorus	19.50 to 20.00
Southern No. 2.....	24.01 to 25.01
Low phos., sil. 1 to 2 per cent, copper free	30.50
Silvery, sil. 8 per cent.....	35.29
Electric ferrosilicon, 14 to 16 per cent	44.42

Plates.—The inquiry from the city of Denver for 7000 tons of plates for a riveted pipe line is the largest tonnage pending. Oil storage tank construction continues to command attention with the placement of 1500 tons with the United Iron Works by the Magnolia Petroleum Co. and the appearance of new inquiries as follows: Superior Oil Co., 1000 tons; Hoofer Oil Co., 800 tons, and Skelly Oil Co., 600 tons. Railroad car buying still lags. Prices show no sign of stiffening, but are higher in this immediate vicinity than in sections where local mills have less freight advantage as compared with competitors in other producing centers.

The mill quotation is 2.25c. to 2.35c., Chicago. Jobbers quote 3.20c. for plates out of stock.

Structural Material.—Fabricating awards for the week exclusive of tank lettings amount to 9500 tons, of which 5000 tons is for the Union League Club Building, Chicago. Fresh inquiries are also in good volume, totaling 6600 tons. Among pending projects which are likely to be placed shortly is a combination hotel, office building and theater, 8000 tons, for Eitel Brothers, proprietors of the Bismarck Hotel, Chicago. Competition between fabricators is very sharp and it is probable that low bidding is causing considerable tonnage to be closed at this time. Prices are weak, but apparently have not sunk any lower.

The mill quotation on plain material is 2.25c. to 2.35c., Chicago. Jobbers quote 3.20c. for plain material out of warehouse.

Bars.—Both new business and inquiries have been the best in six weeks for an important local producer of soft steel bars. The gain, while by no means pronounced, is nevertheless regarded as a good omen because bars, by virtue of their almost universal use, more accurately reflect general conditions in industry than most other commodities. It is also regarded as significant that jobbers are feeling out the market and appear to be at the point of buying. Reports from the automobile industry, while revealing no marked change in operations, offer some ground for encouragement. Shipments from local mills to the automobile trade will be heavier this month than in June. In manufacturing cars during the past 60 days, builders have used up all available spare parts and materials. The moment they get into production on their new models, they will require substantial quantities of fresh material quickly. That steps have already been taken toward heavier automobile output is indicated by the fact that a large frame maker in this vicinity has released against orders of long standing. Soft steel bar prices are not any too steady, but a range of 2.20c. to 2.25c., Chicago, is representative. Demand for bar iron shows no significant change and prices remain at 2.20c., Chicago, although occasional concessions to 2.15c. have been made where the character and size of the specifications have been particularly attractive. The mill of the Republic Iron & Steel Co. at East Chicago will resume operations next Monday after a three weeks' shutdown for repairs. Business in rail steel bars shows little improvement and prices remain unchanged. The Moline

mill will resume next Monday after two weeks of idleness.

Mill prices are: Mild steel bars, 2.20c. to 2.25c., common bar iron, 2.20c., Chicago; rail steel, 2.10c., Chicago mill.

Jobbers quote 3.10c. for steel bars out of warehouse. The warehouse quotations on cold-rolled steel bars and shafting are 3.90c. for rounds and 4.40c. for flats, squares and hexagons, 4.25c. for hoops and 3.75c. for bands.

Jobbers quote hard and medium deformed steel bars at 2.35c. to 2.40c., base; hoops, 4.45c.; bands, 3.95c.

Sheets.—A gradual increase in inquiry, particularly for blue annealed, has raised the hope that business is about to turn the corner. Inquiry is heavier proportionately than buying, which is still noticeably timid and confined to immediate requirements. Sellers are of the opinion that consumers will soon realize that it is a good time to buy, inasmuch as prices are at or below costs, supplies in the hands of users are scraping bottom and little if any surplus stock is to be found in mill warehouses. Demand, when it revives, will immediately affect production and better output will mean a stiffer attitude on prices. While as low as 2.70c., base Pittsburgh, on blue annealed, 4.60c. on galvanized and 3.50c. on black have been reported during the current week, it is no secret that a number of mills have become alarmed at the advance in costs accompanying curtailment of operations and are considering shutting down altogether rather than take business at a loss. Encouragement is derived from the fact that the automobile industry, which has been using every sheet in stock which could be cut down or converted for use, has practically exhausted its supplies and must now enter the market for fresh materials.

Mill quotations are 3.50c. to 3.65c. for No. 28 black, 2.75c. to 2.80c. for No. 10 blue annealed, and 4.70c. to 4.80c. for No. 28 galvanized, all being Pittsburgh prices, subject to a freight rate to Chicago of 34c. per 100 lb.

Jobbers quote f.o.b. Chicago: 2.90c. for blue annealed; 4.70c. for black, and 5.60c. for galvanized.

Wire Products.—Barbed wire and staples have been reduced to \$3.60 per 100 lb. and per keg respectively, while 67½ per cent off list is now the universal discount on woven fence applying to all carlot buyers. At the same time, the terms announced this spring allowing 5 per cent off for cash and six months have been withdrawn and the old terms of 2 per cent off and 60 days have been reestablished. The reduction in prices is intended to compensate for the modification in terms. In other respects, prices remain as indicated under finished iron and steel, f.o.b. Pittsburgh, page 176.

We quote warehouse prices f.o.b. Chicago: No. 6 to No. 9 bright basic wire, \$3.40 to \$3.75 per 100 lb.; extra for black annealed wire, 15c. per 100 lb.; common wire nails, \$3.60 to \$3.65 per 100 lb.; cement coated nails, \$3 per keg.

Rails and Track Supplies.—The Great Northern has entered the market for 2000 tons of tie plates, 106,000 track bolts and 51,000 angle bars. Otherwise there have been no new developments in track materials.

Standard Bessemer and open-hearth rails, 443; light rails, rolled from billets, 2.10c., f.o.b. makers' mills.

Standard railroad spikes, 3.10c. mill; track bolts with square nuts, 4.10c. mill; steel tie plates, 2.60c., f.o.b. mill; angle bars, 2.75c. f.o.b. mill.

Jobbers quote standard spikes out of warehouse at 3.65c. base, and track bolts, 4.65c. base.

Cast Iron Pipe.—Water pipe, 6 in. to 12 in. in diameter, appears to have stabilized at \$47, base Birmingham, while diameters above 12 in. are quoted \$1 lower. Minneapolis will take bids July 21 on 1500 tons of 6- to 16-in., while St. Paul will receive tenders this week on 600 tons of 30-in. Springfield, Ill., takes figures July 21 on 130 tons. Watertown, Wis., opens bids July 14 on 115 tons. Bensonville, Ill., has awarded 625 tons to the National Cast Iron Pipe Co. The United States Cast Iron Pipe & Foundry Co. will furnish several hundred tons for Detroit suburbs.

We quote per net ton, f.o.b. Chicago, as follows: Water pipe, 4-in., \$59.20; 6-in. to 12-in., \$55.20; over 12-in., \$54.20; Class A and gas pipe, \$5 extra.

Bolts, Nuts and Rivets.—Both railroads and jobbers are showing greater interest in the market, but have not yet placed sufficient business to affect the price situation. Bolts are generally quoted on the basis of 60 and 20 off, Chicago, on large machine, but 70 off is not uncommon, and better than that has been done

on attractive lots. On small rivets the market ranges from 70 and 5 off to 70 and 10 and 5 off, Chicago, while large rivets are generally quoted at \$2.85 per 100 lb., Chicago.

Jobbers quote structural rivets, 3.65c.; boiler rivets, 3.85c.; machine bolts up to ¾ x 4 in., 60 per cent off; larger sizes, 60 off; carriage bolts up to ¾ x 6 in., 55 off; larger sizes, 55 off; hot pressed nuts, squares and hexagons, tapped, \$5 off; blank nuts, \$4 off; coach or lag screws, gimlet points, square heads, 65 per cent off.

Old Material.—The purchase of 2000 tons of heavy melting by a local independent at \$15.25 to \$15.50 delivered has further stimulated speculation on the part of dealers and already as high as \$16 has been offered by them for that material. There have also been consumer purchases of cast scrap at slight advances in prices. The buoyancy of heavy melting and allied grades is accounted for, in part, by the fact that they are not coming on to the market as fast they are being purchased. Railroad offerings are heavier this week, including the Chesapeake & Ohio, 11,000 tons; Santa Fe, 3700 tons; Northern Pacific, 1300 tons; Pere Marquette, 1000 tons; Soo Line and Monon, 500 tons each.

We quote delivery in consumers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

	Per Gross Ton
Iron rails	\$16.50 to \$17.00
Cast iron car wheels	16.50 to 17.00
Relaying rails, 56 and 60 lb.	20.00 to 27.00
Relaying rails, 65 lb. and heavier	27.00 to 32.00
Forged steel car wheels	17.50 to 18.00
Railroad tires, charging box size	18.00 to 18.50
Railroad leaf springs, cut apart	18.00 to 18.50
Rails for rolling	15.50 to 16.00
Steel rails, less than 3 ft.	17.00 to 17.50
Heavy melting steel	15.50 to 16.00
Frogs, switches and guards cut apart	15.50 to 16.00
Shoveling steel	15.00 to 15.50
Drop forge flashings	10.00 to 10.50
Hydraulic compressed sheets	12.00 to 12.50
Axle turnings	12.00 to 12.50
Steel angle bars	16.00 to 16.50
Steel knuckles and couplers	17.50 to 18.00
Coil springs	19.00 to 19.50
Low phos. punchings	15.00 to 15.50
Machine shop turnings	8.00 to 8.50
Cast borings	10.50 to 11.00
Short shoveling turnings	10.50 to 11.00
Railroad malleable	17.50 to 18.00
Agricultural malleable	16.00 to 16.50

	Per Net Ton
Iron angle and splice bars	16.00 to 16.50
Iron arch bars and transoms	17.00 to 17.50
Iron car axles	23.00 to 23.50
Steel car axles	17.00 to 17.50
No. 1 busheling	11.00 to 11.50
No. 2 busheling	8.00 to 8.50
Pipes and flues	9.00 to 9.50
No. 1 railroad wrought	13.00 to 13.50
No. 2 railroad wrought	13.75 to 14.25
No. 1 machinery cast	17.00 to 17.50
No. 1 railroad cast	16.00 to 16.50
No. 1 agricultural cast	16.00 to 16.50
Locomotive tires, smooth	15.00 to 15.50
Stove plate	13.75 to 14.25
Grate bars	14.50 to 15.00
Brake shoes	14.00 to 14.50

Reinforcing Bars.—The trade is gaining encouragement from the fact that awards are keeping up to the average and prices, although still flexible, have not lost any further ground. The market is still fairly represented by a range from 2.35c. to 2.40c., local warehouse. A leading award of the week was 700 tons for the W. F. Hall Printing Co. plant, Chicago. Prominent among pending jobs is the Morrell Power Station, Detroit, 1100 tons, and the Twenty-third Street viaduct for the South Park Commissioners, Chicago, 700 tons, on which general contract bids will be taken July 16.

Lettings include:

Junior High School, Kenosha, Wis., 250 tons to Truscon Steel Co.

Wilson School, Wauwatosa, Wis., 125 tons to Truscon Steel Co.

W. F. Hall Printing Co. plant, Chicago, 700 tons to American System of Reinforcing.

Standard Sanitary Mfg. Co. warehouse, Milwaukee, 200 tons to American System of Reinforcing.

Swanson Building, Chicago, 250 tons to Olney J. Dean Co. Locust Street School, Milwaukee, Wis., 300 tons to Concrete Steel Co.

Filtration plant in the vicinity of St. Paul, Minn., 146 tons to Concrete Steel Co.

Bell Telephone Co. building, Champaign, Ill., 100 tons to Olney J. Dean Co.

Pending work includes:

Morrell power station, Detroit, 1100 tons, general contract awarded to H. G. Christman, Detroit.

Gridley filtration plant for water works, Minneapolis, 285 tons.

New York

Light Buying of Pig Iron, But Prices Do Not Show Further Concessions

NEW YORK, July 15.—Buying of pig iron has been at a very moderate rate, but prices are steady and no further concessions have been reported. Furnaces are showing a marked disposition not to quote for the fourth quarter, but a Jersey melter succeeded in buying 400 tons of No. 1X for that quarter, and inquiries for several lots are pending. The Gould Coupler Co., which has been in the market for 1000 to 2000 tons of malleable and 1000 to 3000 of basic, has not closed. The Burnham Boiler Co. is in the market for 500 tons of No. 2X and No. 2 iron for delivery at Elizabeth, N. J. One corporation is reported to have sold 1000 tons of special analysis German iron in the South. Reports of the possibility of importing Chinese iron are heard.

We quote delivered in the New York district as follows, having added to furnace price \$2.27 freight from eastern Pennsylvania, \$4.91 from Buffalo and \$5.44 from Virginia:

East. Pa. No. 1X fdy., sil. 2.75	
to 3.25	\$23.77 to \$24.27
East. Pa. No. 2X fdy., sil. 2.25	
to 2.75	23.27 to 23.77
East. Pa. No. 2, sil. 1.75 to 2.25..	22.77 to 23.27
Buffalo, sil. 1.75 to 2.25.....	23.91
No. 2X Virginia, sil. 2.25 to 2.75..	31.44
No. 2 Virginia, sil. 1.75 to 2.25...	30.44

Ferroalloys.—Sales of ferromanganese during the past week were limited to a few hundred tons, on which the full price, \$107.50, is reported to have been paid on every lot, the transactions being mostly of carload size. Although prices of both domestic and foreign alloy have been holding for some time at the same figure, \$107.50, a new factor is introduced into the situation by offers of a domestic maker, not recently active in the market, whose quotations are on the basis of \$105, furnace. There appears to be a considerable spread in the prices quoted on 50 per cent ferrosilicon, some sellers asking \$75, delivered, but distress tonnage for resale has been offered at several dollars below this figure.

Cast Iron Pipe.—Demand for water pipe continues light and largely confined to local purchases by private companies. Lack of inquiry for large tonnages is probably responsible for the unchanged condition of quotations. We quote per net ton, f.o.b. New York, in carload lots, as follows: 6-in. and larger, \$60.60 to \$61.60; 4-in. and 5-in., \$65.60 to \$66.60; 3-in., \$75.60 to \$76.60, with \$5 additional for Class A and gas pipe. Jobbers of soil pipe are apparently carrying small stocks and depending upon makers for prompt shipment. No change has occurred in discounts, although some southern independents are reported offering as high as 55 per cent off. The only effect of this quotation thus far has been to develop an undertone of weakness. We quote discounts of both southern and northern makers, f.o.b. New York, as follows: 6-in., 40 to 40% per cent off list; heavy, 50 to 50% per cent off list.

Finished Iron and Steel.—More inquiry has reached the local offices of steel companies in the past week than in any recent week, but orders have made no important gains either in number or the amount of tonnage involved. A moderate business in structural steel work has been done, and a fair amount of tonnage is pending. Prices of finished steel products have shown practically no change since the first of the month. Eastern mills quote plates at 1.90c. to 2c., Pittsburgh, but on orders of good size it is unquestioned that 1.80c. to 1.85c., Pittsburgh, could be done. On structural shapes the situation is unchanged, Pittsburgh mills quoting 2.15c., but two Eastern mills have freely quoted 2c., Pittsburgh, and concessions from this figure have been available on the more attractive lots. Bars are still held at 2.15c., Pittsburgh, and there appears to be little or no deviation from this price, except possibly in the case of concrete reinforcing bars, concessions being given on hard steel bars.

We quote for mill shipments, New York delivery, as follows: Soft steel bars, 2.49c. to 2.54c.; plates, 2.19c. to 2.34c.; structural shapes, 2.34c. to 2.44c.; bar iron, 2.44c.

Warehouse Business.—The market is as quiet as at any time this year. Prices are unchanged, but, despite the light business that has prevailed for many weeks, there is apparently little or no inclination to make any large concessions. Except for occasional reductions of not more than 5c. per 100 lb., both black and galvanized sheets continue firm. Warehouses handling wrought iron and steel pipe report a continuance of the weakness prevalent in the past few weeks, but reductions in this market, too, are generally small. On some grades of steel transactions between jobbers are noted occasionally to fill in on certain sizes. Deliveries from mills are not as good as formerly, a result of the low rate of operation. We quote prices on page 192.

Coke.—There is a slightly firmer tone to foundry coke, but furnace is still inclined to weakness. A producer of a standard brand of foundry is contracting for third quarter at \$5.25 per ton and for fourth quarter at \$5.75 per ton. Standard foundry for prompt shipment is quoted at from \$4.75 to \$5.25 per ton and standard furnace at \$3.50 to \$3.75 per ton.

Old Material.—The market shows but little change from the condition of preceding weeks. No. 1 heavy melting steel, railroad grade or equivalent, is still being purchased by dealers and brokers at \$14.50 to \$15.50 per ton, delivered to eastern Pennsylvania consumers. Rumors of a fair tonnage of No. 1 heavy melting steel, sold last week at \$15 to an eastern Pennsylvania mill that has been paying \$14.50 per ton, delivered, cannot be confirmed. Further buying by the same consumer is reported at \$14.50 per ton, delivered. Borings and turnings are particularly quiet, only small shipments to a Riddlesburg consumer being noted at \$12 per ton, delivered. Machine shop turnings are quotable at about \$12.50 per ton, delivered eastern Pennsylvania. Specification pipe is being purchased at \$15 and \$15.50 per ton, delivered to consumers at Milton and Lebanon, Pa. Forge fire is worth from \$12.50 to \$13 per ton, delivered eastern Pennsylvania. Most other grades show no changes.

Buying prices per gross ton New York follow:

Heavy melting steel, yard.....	\$10.25 to \$10.75
Heavy melting steel, railroad or equivalent	11.50 to 12.00
Rails for rolling.....	14.00 to 14.50
Relaying rails, nominal.....	24.00 to 25.00
Steel car axles.....	16.00 to 17.00
Iron car axles.....	23.00 to 24.00
No. 1 railroad wrought.....	14.50 to 15.00
Forge fire	8.75 to 9.25
No. 1 yard wrought, long.....	13.50 to 14.00
Cast borings (clean).....	8.75 to 9.25
Machine-shop turnings	8.50 to 9.00
Mixed borings and turnings.....	7.25 to 7.75
Iron and steel pipe (1 in. diam., not under 2 ft. long).....	11.25 to 11.75
Stove plate	10.75 to 11.75
Locomotive grate bars.....	11.50 to 12.50
Malleable cast (railroad).....	14.00 to 14.50
Cast iron car wheels.....	13.50 to 14.00
No. 1 heavy cast, not cupola size	12.00 to 12.50

Prices which dealers in New York and Brooklyn are quoting to local foundries per gross ton follow:

No. 1 machinery cast.....	\$15.00 to \$15.50
No. 1 heavy cast (columns, building materials, etc.), cupola size	13.00 to 13.50
No. 2 cast (radiators, cast boilers, etc.)	12.00 to 12.50

Detroit Scrap Market

DETROIT, July 15.—The market on old material is holding at the same level with current sales of small tonnage in the district. There has been no appreciable increase in melting conditions and it is doubtful whether this situation will change before the first of the month.

The following prices are quoted on a gross ton basis f.o.b. cars producers' yards, excepting stove plate, No. 1 machinery cast and automobile cast, which are quoted on a net ton basis:

Heavy melting steel.....	\$13.25 to \$14.25
Shoveling steel	13.00 to 14.00
Borings	10.50 to 11.50
Short turnings	10.50 to 11.50
Long turnings	9.50 to 10.25
No. 1 machinery cast	15.00 to 16.00
Automobile cast	18.00 to 19.00
Hydraulic compressed	11.00 to 12.00
Stove plate	13.50 to 14.50
No. 1 busheling	10.00 to 11.00
Sheet clippings	8.00 to 9.00
Flashings	9.50 to 10.50

Cincinnati

Southern Ohio Pig Iron Advances 50 Cents— May Go Higher

CINCINNATI, July 15.—The feature of the pig iron market was the stiffening of prices in the Ironton district. The southern Ohio market has advanced 50c. a ton during the past few days, now being quoted at a minimum of \$19.50, Ironton, with a prospect of a further advance of 50c. per ton this week. We note one sale of 2000 tons of southern Ohio at \$19.50, besides a number of sales ranging from carload lots to 500 tons. The Southern market is now \$18, Birmingham basis, and a sale of 500 tons was made on that basis. The inquiry is fair, the largest being one from Indiana for 1000 tons of malleable. An implement manufacturer in central Ohio is inquiring for 500 tons of malleable, and there is also an inquiry for 1000 tons of Southern from a Tennessee stove works. The Lenoir Car Works has not yet closed its inquiry for 500 tons of Southern. Better feeling is noted in the trade and tonnages which had been held up for some time are now beginning to move.

Based on freight rates of \$4.05 from Birmingham and \$2.27 from Ironton we quote f.o.b. Cincinnati:
Southern coke, sil. 1.75 to 2.25 (base).....\$22.05
Southern coke, sil. 2.25 to 2.75 (No. 2 soft) 22.55
Ohio silvery, 8 per cent (nominal)..... 32.77
Southern Ohio coke, sil. 1.75 to 2.25 (No. 2) 21.77
Basic Northern 21.27
Malleable 21.77

Sheets.—No change is apparent in the situation, buying still being largely of fill-in tonnages, and prices ruling about the same as last week, namely, 2.75c. for blue annealed, 3.50c. for black and 4.60c. for galvanized. Quotations of 4.50c. for galvanized sheets are reported from Southern points, but most of the orders are being placed at 4.60c., though in some cases 4.75c. has been done.

Structural Activity.—Fair activity characterized the structural market early in the week, but inquiries have again fallen off to almost nothing. A number of fair-sized awards were made, with other lettings scheduled for the next two weeks. Railroads continue to be fair buyers, with highway construction work also showing activity. Extremely low prices are being quoted on structural work, being in the near vicinity of \$70 per ton delivered.

Reinforcing Bars.—The bars for the rapid transit loop at Cincinnati, 900 tons, have been awarded the Cambridge Steel Co. This was the only important letting, though small jobs are fairly numerous. The range of prices continues to be from 1.95c. to 2.15c. on open quotations, but prices are rather flexible, and probably could be shaded on attractive business.

Warehouse Business.—Local jobbers report a slight increase in orders this month over the corresponding period of June, but business is dull. However, slight as the improvement is, it is giving cause for optimism, as it is admitted that stocks of steel in manufacturers' hands are extremely low. Any improvement in general business will certainly be reflected in the demand for steel. No particular item is in demand, though reinforcing bars are more active than other products. Prices are steady and unchanged from last week's quotations.

Cincinnati jobbers quote: Iron and steel bars, 3.40c.; reinforcing bars, 3.50c.; hoops, 4.45c.; bands, 4.15c.; shapes, 3.50c.; plates, 3.50c.; cold-rolled rounds, 4.15c.; cold-rolled flats, squares and hexagons, 4.65c.; open-hearth spring steel, 5c. to 6c.; No. 10 blue annealed sheets, 4c.; No. 28 black sheets, 4.70c.; No. 28 galvanized sheets, 5.75c.; No. 9 annealed wire, 3.30c.; common wire nails, \$3.30 per keg base; cement coated nails, \$3 per keg.

Finished Materials.—The market continues dull, the only inquiry of consequence for the heavier materials being one for 575 tons of plates from the Louisville & Nashville Railroad. There has been some slight activity in shapes, coming mostly from the smaller fabricators for highway bridges. The demand for bars is very light. Plates prices are weak, and on attractive tonnages some mills are willing to accept orders at 2c. Others are quoting 2.10c., while some of the larger producers are holding for 2.15c. For bars and shapes, the

lowest open quotation in this market has been 2.15c., though it is not denied that this price would be shaded for desirable specifications. Little interest is shown in wire products, and prices are reported to be rather soft, with nails being quoted at \$3 per keg delivered, Cincinnati. No changes in wire prices are reported. Track accessories and fastenings are not in demand, though prospects for light rail business from the coal mining regions are considerably improved.

Coke.—The coke market is quiet. A southern Ohio furnace continues to negotiate for 6000 tons per month for three months, and we note a sale of 1000 tons of Wise County furnace coke at \$4, ovens. Prices in New River district are lower, it now being possible to buy foundry coke at \$8.50.

Connellsville furnace, \$3.15; foundry, \$4.50; New River foundry, \$8.50; Wise County furnace, \$3.75; foundry, \$4.50; by-product foundry, \$7.50; Connellsville basis.

Old Material.—The scrap market in the Cincinnati district continues dull, and only one of the steel plants is taking in materials. Scrap is moving to Valley points in fair volume and dealers are also purchasing for yard stocks. The price situation is steady at last week's quotations.

We quote dealers' buying prices, f.o.b. cars, Cincinnati:

Per Gross Ton	
Heavy melting steel.....	\$13.00 to \$13.50
Scrap rails for melting.....	12.00 to 12.50
Short rails.....	17.00 to 17.50
Relaying rails.....	28.50 to 29.00
Rails for rolling.....	14.00 to 14.50
Old car wheels.....	13.00 to 13.50
No. 1 locomotive tires.....	14.00 to 14.50
Railroad malleable.....	15.50 to 16.00
Agricultural malleable.....	14.00 to 14.50
Loose sheet clippings.....	8.50 to 9.00
Champion bundled sheets.....	10.50 to 11.00

Per Net Ton	
Cast iron borings.....	9.50 to 10.00
Machine shop turnings.....	8.50 to 9.00
No. 1 machinery cast.....	18.00 to 18.50
No. 1 railroad cast.....	14.50 to 15.00
Iron axles.....	21.00 to 21.50
No. 1 railroad wrought.....	10.50 to 11.00
Pipes and flues.....	7.50 to 8.00
No. 1 busheling.....	9.50 to 10.00
Mixed busheling.....	7.00 to 7.50
Burnt cast.....	10.50 to 11.00
Stove plate.....	10.50 to 11.00
Brake shoes.....	11.50 to 12.00

Buffalo

Pig Iron Inquiry Fair and Prices Steady— Better Feeling Prevails

BUFFALO, July 15.—Inquiry and orders for pig iron are holding up fairly well. One maker has an aggregate of 20,000 tons of inquiry and has sold about 12,000 tons, or possibly a little more, including 7500 tons of foundry for a district melter. The Gould Coupler Works is seeking 1000 to 2000 tons of malleable and 1000 to 3000 tons of basic. A concern in the neighborhood of New York seeks 1000 tons of foundry and a Bridgeport, Conn., consumer asks for 1000 tons. A local pig iron maker has itself purchased a tonnage of basic for use of its mills, pending a time when its active blast furnace goes down. It is not known what the purchase amounts to, but the inquiry is said to have been for 15,000 tons. The price is still \$19 base, with some makers obtaining the differential for the higher silicons and others relinquishing it. The Rogers-Brown Iron Co. has put its third furnace out of blast, and the Donner Steel Co. will probably light a furnace early in August, regardless of whether the present active stack stays in blast.

We quote f.o.b., gross ton, Buffalo, as follows:

No. 1 foundry, sil. 2.75 to 3.25...	\$19.00 to \$20.00
No. 2 foundry, sil. 2.25 to 2.75...	19.00 to 19.50
No. 3 plain, sil. 1.75 to 2.25.....	19.00
Basic.....	19.00
Malleable.....	19.00
Lake Superior charcoal.....	29.28

Finished Iron and Steel.—An improved sentiment is noticeable in this market, with orders holding up very well. The bar business offering is not voluminous, but considerable carload lots are available. Mills are endeavoring to hold to a 2.20c. price where possible, but the prevailing figure is 2.15c. An inquiry from Syracuse is for 100 tons. Very little sheet inquiry is out.

The mills of the Seneca Iron & Steel Co. have resumed operation to the extent of six. A few of the smaller outside mills are making stiff competition for sheets. It is known that black sheets have been shaded to 3.50c. in a few instances and galvanized to 4.65c. The general price is 3.60c. to 3.65c. for black and 4.70c. to 4.75c. for galvanized. Pipe business is holding up very well, with no change in prices, despite the general sentiment a short time ago that a revision would be made. Public Works Commissioner Schwartz, Buffalo, states that it is planned to place 125,000 ft. of 16-in. and 6-in. mains within the next few months. The contract for five pumps for the new Buffalo filtration plant was assigned formally by A. J. Abels & Co., the successful bidder, to the Dayton-Dowd Co., Quincy, Ill., which will manufacture the pumps for the city.

Steel bars, 3.40c.; iron bars, 3.35c.; reinforcing bars, 3.40c.; structural shapes, 3.50c.; plates, 3.50c.; No. 10 blue sheets, 4.05c.; No. 28 black sheets, 4.75c.; No. 28 galvanized sheets, 5.85c.; bands, 4.15c.; hoops, 4.50c.; cold finished rounds, 4.30c.; cold finished shapes, 4.80c.

Old Material.—A little better feeling is apparent, but this has not yet been translated into active buying. One mill which has been very tight on shipments is now accepting them a little more freely. Though it is probable that \$15 would have to be paid for a round tonnage of heavy melting steel, a mill which has been picking up small lots has been able to buy considerable tonnages at \$14 and odd lots for even less. This same interest has been buying some hydraulic compressed at \$12.50. Heavy flashings have been bought around \$13 to \$13.50.

We quote f.o.b., gross ton, Buffalo, as follows:

Heavy melting steel.....	\$14.50 to \$15.00
Low phos., 0.04 and under.....	17.00 to 18.00
No. 1 railroad wrought.....	12.50 to 13.00
Car wheels.....	17.50 to 18.00
Machine shop turnings.....	11.00 to 11.50
Cast iron borings.....	12.00 to 12.50
No. 1 busheling.....	12.00 to 13.00
Stove plate.....	15.00 to 16.00
Grate bars.....	14.50 to 15.00
Bundled sheets.....	8.00 to 9.00
Hydraulic compressed.....	14.00 to 14.50
Railroad malleable.....	17.00 to 18.00
No. 1 machinery cast.....	16.50 to 17.50

Boston

Transactions in Pig Iron Have Dropped to Small Proportions

BOSTON, July 15.—Transactions in pig iron have dropped to small proportions. The largest transaction the past week involved 2000 tons of basic, purchased by a wire manufacturer, 1300 to 1500 tons from a Buffalo furnace and the remainder from eastern Pennsylvania on a delivered basis of around \$23.50 a ton. Sales otherwise are confined to small tonnages, Buffalo and New York State furnaces making most of them. Buffalo No. 2 plain is selling at \$23.91 delivered, No. 2X at \$23.91 to \$24.41, and No. 1X at \$24.41 to \$25.41, third quarter, and 50c. a ton more for fourth quarter, for the latter shipment in a very limited way. New York State third quarter No. 2X sold the past week at \$23.15 delivered and No. 1X at \$23.65. Buffalo malleable, silicon around 1.50, sold at just under \$24 delivered. Northern irons, therefore, are no stronger, and an unconfirmed report is that eastern Pennsylvania furnaces are offering low silicon irons at slight concessions. A Springfield, Mass., foundry has yet to cover on 1000 tons. During the past week, three lots of India iron, aggregating 3512 tons, arrived at this port, all of which was previously sold.

We quote delivered prices on the basis of the latest reported sales as follows, having added \$3.65 freight from eastern Pennsylvania, \$4.91 from Buffalo, \$5.92 from Virginia and \$9.60 from Alabama:

East. Penn., sil. 2.25 to 2.75.....	\$25.15 to \$25.65
East. Penn., sil. 1.75 to 2.25.....	23.65 to 25.15
Buffalo, sil. 2.25 to 2.75.....	23.91 to 24.41
Buffalo, sil. 1.75 to 2.25.....	23.91
Virginia, sil. 2.25 to 2.75.....	31.42 to 32.42
Virginia, sil. 1.75 to 2.25.....	30.92 to 31.92
Alabama, sil. 2.25 to 2.75.....	30.10 to 31.10
Alabama, sil. 1.75 to 2.25.....	29.60 to 30.60

Shapes and Plates.—Leading mills are holding to 2.15c., Pittsburgh base, on shapes, while independent ones are inclined to shade prices, 2c. representing the low point in the market. The market for plates continues unsettled, with 1.80c., Pittsburgh base, the prevailing price. Mill representatives intimate less could be done on a large tonnage. Most of the fabricating work coming into the market involves small tonnages, on which the fabricator's profit is satisfactory. One of the largest fabricators has approximately eight weeks' unfilled business on its books. Bookings of a majority of the fabricators are less extended.

Coke.—The Providence Gas Co., followed by the New England Coal & Coke Co., has reduced by-product foundry coke from \$12 to \$11.50 delivered in New England. Both concerns report specifications against contracts falling off due to the inactivity of foundries. It is estimated by coke interests that New England foundries, Connecticut excepted, are not operating at much more than 25 per cent of capacity. Makers of fuel in this district are meeting still competition from a New Jersey by-product coke producer, who has made sales in this territory at \$10 to \$10.79 delivered, according to the freight rate from seaboard.

Old Material.—Although quiet, the old material market is on a very firm basis. Current activity is largely confined to heavy melting steel, machine shop turnings, specification pipe, shafting and skeleton, all for eastern Pennsylvania consumption. Tonnages involved are small, however. A large percentage of the railroad scrap sold recently is for Western consumption, mostly the Chicago district. Broadly speaking, old material now available is in strong hands. The inactivity of metal working industries has shortened the supply of borings and turnings, as well as skeleton. Recent purchases of shafting were made at \$18 a ton on cars, for eastern Pennsylvania shipment. For New England consumption the market is about \$1 a ton less. Cotton ties are fetching \$8 to \$8.15 on cars.

The following prices are for gross ton lots delivered consuming points:

No. 1 machinery cast.....	\$19.50 to \$20.00
No. 2 machinery cast.....	16.50 to 17.00
Stove plates.....	14.50 to 15.00
Railroad malleable.....	16.50 to 17.00

The following prices are offered per gross ton lots, f.o.b. Boston rate shipping points:

No. 1 heavy melting steel.....	\$10.50 to \$11.75
No. 1 railroad wrought.....	12.50 to 13.00
No. 1 yard wrought.....	11.50 to 12.00
Wrought pipe (1-in. in diam., over 2 ft. long).....	10.50 to 10.75
Machine shop turnings.....	7.50 to 8.00
Cast iron borings, chemical.....	9.00 to 9.50
Cast iron borings, rolling mill.....	8.00 to 8.50
Blast furnace borings and turnings.....	6.50 to 7.00
Forged scrap and bundled skeleton.....	7.00 to 8.00
Shafting.....	16.00 to 17.00
Street car axles.....	15.00 to 15.50
Rails for rolling.....	12.00 to 12.25

St. Louis

Chicago Pig Iron Sold at New Concessions Stimulates Business

ST. LOUIS, July 15.—The week was marked by further recessions in the price of pig iron, which had the effect of stimulating some business. But this buying was largely confined to the product of the St. Louis Coke & Iron Co. This concern has reduced its price to \$20 to \$20.50 Granite City, a nominal quotation. Chicago makers made quotations as low as \$18, Chicago, for this territory, which price was no doubt met by the Granite City makers to bring about the sale of about 5500 tons. These sales were as follows: 3000 tons to an Illinois car wheel maker for prompt shipment; 500 tons for prompt shipment to a Missouri car wheel maker; 100 tons to a Kansas melter; 1600 tons in lots of 100 to 500 tons for shipment through July and August, and 300 tons in carload lots to Indiana, Iowa, Missouri and Kansas melters for prompt shipment. Some of this buying is believed to be speculative. The same maker also sold a car of high silicon iron for prompt shipment to Mexico. A leading Southern interest sold 400 tons of foundry iron on a basis

of \$17.25, Birmingham, for water and rail shipment from Florence. The most important inquiry before the market is for 1000 to 1500 tons of malleable for last half delivery to an Indiana melter. A Quincy machinery manufacturer is in the market for 300 tons of foundry iron for shipment within the next 60 to 90 days.

We quote delivered consumers' yards, St. Louis, as follows, having added to furnace prices \$2.16 freight from Chicago, \$3.28 from Florence and Sheffield (rail and water), \$5.17 from Birmingham, all rail, and 81c. average switching charge from Granite City:

Northern fdy., sil. 1.75 to 2.25	\$20.66 to \$21.16
Northern malleable, sil. 1.75 to 2.25	20.66 to 21.16
Basic	20.66 to 21.16
Southern fdy., sil. 1.75 to 2.25	23.17
(rail)	21.28
Southern fdy., sil. 1.75 to 2.25	21.28
(rail and water)	21.31
Granite City iron, sil. 1.75 to 2.25	20.81 to 21.31

Finished Iron and Steel.—A trunk line road issued an inquiry for its requirements for angle bars for the remainder of the year. This was the first railroad inquiry in some time. However, it developed that the inquiry was issued in error. Purchasing agents have been instructed to hold off all buying for the present. The Laclede Steel Co. got the order for 125 tons of reinforcing bars for the Ralston-Purina building. The only activity in structural steel is specifications against contracts, and these are only fair. There is no demand for sheet steel and the business in plates is light. Warehouse business is dull.

For stock out of warehouse we quote: Soft steel bars, 3.35c. per lb.; iron bars, 3.35c.; structural shapes, 3.45c.; tank plates, 3.45c.; No. 10 blue annealed sheets, 4.10c.; No. 28 black sheets, cold-rolled one pass, 5c.; cold rolled rounds, shafting and screw stock, 4.15c.; structural rivets, 3.90c.; boiler rivets, 4.10c.; tank rivets, 3/4-in. and smaller, 60 per cent off list; machine bolts, 55 and 5 per cent; carriage bolts, 40-5 per cent; lag screws, 60 and 5 per cent; hot pressed nuts, squares or hexagons, blank or tapped, \$3.50 off list.

Coke.—The coke market continues very dull. Buying of foundry grades from by-product producers and from the Connellsville district is light. Dealers refuse to show any interest in buying domestic grades.

Old Material.—A leading user of such specialties as couplers, axles and springs is in the market, and these items are higher in price. Other consumers are holding off, and yet the market is firm and prices higher. Dealers are eager to get material in anticipation of business they expect to do, which is giving the market its strength. New railroad lists include the following: Norfolk & Western, 7000 tons; Santa Fe System, 4000 tons; Northern Pacific, 1600 tons; Missouri-Kansas-Texas, 900 tons; Kansas City Southern, 300 tons.

We quote dealers' prices f.o.b. consumers' works, St. Louis industrial district and dealers' yards, as follows:

Per Gross Ton	
Iron rails	\$12.00 to \$12.50
Rails for rolling	14.75 to 15.25
Steel rails less than 3 ft.	16.00 to 16.50
Relaying rails, 60 lb. and under	25.00 to 26.00
Relaying rails, 70 lb. and over	32.50 to 33.50
Cast iron car wheels	15.50 to 16.00
Heavy melting steel	13.25 to 13.75
Heavy shoveling steel	13.25 to 13.75
Frogs, switches and guards cut apart	14.25 to 14.75
Railroad springs	18.50 to 19.00
Heavy axles and tire turnings	11.00 to 11.50
No. 1 locomotive tires	14.50 to 15.00

Per Net Ton	
Steel angle bars	13.00 to 13.50
Steel car axles	17.00 to 17.50
Iron car axles	22.00 to 22.50
Wrought iron bars and transoms	16.50 to 17.00
No. 1 railroad wrought	11.00 to 11.60
No. 2 railroad wrought	12.00 to 12.50
Cast iron borings	9.00 to 9.50
No. 1 busheling	11.00 to 11.50
No. 1 railroad cast	14.00 to 14.50
No. 1 machinery cast	16.50 to 17.00
Railroad malleable	12.50 to 13.00
Machine shop turnings	5.50 to 6.00
Champion bundled sheets	7.50 to 8.00

Newspaper reports that a portion of the by-product coke plant of the Weirton Steel Co. had been destroyed by an acid explosion July 14 are erroneous. The explosion occurred at the plant of the By-Products Steel Corporation, a detinning company, plant of which is located in Weirton, a short distance from the Weirton Steel Co. tin mills.

Birmingham

Sellers Disappointed by Limited Demand for Pig Iron at Low Prices

BIRMINGHAM, ALA., July 15.—Southern furnace interests are not at all satisfied with the total amount of iron sold following the readjustment of quotations, No. 2 foundry now selling at from \$18 to \$18.50 per ton. It is estimated that this district disposed of around 100,000 tons of foundry iron but the buying now being done is of the hand-to-mouth kind again, and persistency is noted in asking concessions from the low price. The Woodward Iron Co. has reduced wages again, a 10 per cent cut being announced except for common labor. Independent coal and coke producers have also readjusted wages and intimation is given that some of the iron producers will follow suit shortly. The furnace operators have been complaining as to the close margin between costs of production and selling price and assert that they must either reduce costs or production. Apparently labor has accepted the readjustment of wages but with the understanding that this condition is to be temporary. The bulk of the iron moving now is for the immediate district consumption, but a little is leaving the territory, a Louisville industry to get 10,000 tons. The larger melters, cast iron pipe companies, in particular, have not been in the local market any lately.

We quote per gross ton, f.o.b. Birmingham district furnace as follows:

No. 1 foundry, 2.25 to 2.75 sil.	\$18.50 to \$19.50
No. 2 foundry, 1.75 to 2.25 sil.	18.00 to 18.50
Basic	18.50 to 19.00
Charcoal, warm blast	31.00

Cast Iron Pipe.—Producers of gas and water cast iron pipe are shipping their product as quickly as it is being manufactured and the activity at the several shops in this district is near capacity. While lettings have been more numerous than they are now, considerable business is being received, shipments of the product being in practically every direction west of the Mississippi and Ohio rivers.

We quote class B, 4-in. water, \$51.00 to \$52.00; 6-in. and over, \$47.00 to \$48.00; class A, \$5 higher; standard soil pipe, \$60; heavy gage, \$45; standard fittings, \$110.

Steel.—The operations in the various steel works in the Birmingham district show no change and this is taken as the barometer of conditions. Steel rail is being delivered from the plant of the Tennessee Coal, Iron & Railroad Co. at Ensley in great quantity.

Coke.—The production of coke is being readjusted in Alabama to meet the demand. The reduction so far has been mainly with the iron companies, but one independent company so far having cut down the output. The quotations are weaker, \$5.50 being average price for foundry coke and \$5 for furnace coke.

Scrap.—There has been but little activity of late in the scrap iron and steel market in this section, and dealers welcome the small lot orders, two cars of the product at the time attracting attention. Much scrap has been accumulated. Country scrap is being offered while the railroads have a large tonnage. Heavy melting steel shows not the slightest change, \$11 being quoted.

We quote per gross ton f.o.b. Birmingham district yards as follows:

Cast iron borings, chemical	\$15.00 to \$16.00
Heavy melting steel	11.00 to 12.00
Railroad wrought	10.00 to 11.00
Steel axles	17.00 to 18.00
Iron axles	19.00 to 19.50
Steel rails	11.00 to 12.00
No. 1 cast	15.00 to 16.00
Tram car wheels	15.00 to 16.00
Car wheels	14.00 to 15.00
Stove plate	14.00 to 15.00
Machine shop turnings	6.00 to 7.00
Cast iron borings	8.00 to 9.00
Rails for rolling	15.00 to 16.00

Building permits were issued in St. Louis during June for improvements of the estimated cost of \$2,592,272, against \$2,905,805 in June, 1923, a loss of \$313,593.

Cleveland

More Activity in Automotive Field, but Steel Market Drags

CLEVELAND, July 15.—The finished steel market continues to drag, with buying limited to very small lots. There is a little more activity in the automotive field owing to the bringing out of new models, and this has stimulated the demand for alloy steel and has resulted in an increase in operation by two Ohio steel plants that manufacture alloy steels. Manufacturers of hot-rolled strip steel also report some improvement in orders both from car builders and from cold-rolled mills. Detroit reports a motor car production of approximately 10,000 a day in that city and that stocks of cars have been considerably reduced. Metal working shops in this territory are operating at an average of about 35 per cent, and their stocks of steel have been reduced to a very low point. In the structural field the only sizable award during the week was 2600 tons for a power house for the Cleveland Electric Illuminating Co. The 1000 tons of steel for an ore bridge recently placed for Ashtabula has been taken by a Pittsburgh district mill. New structural inquiry is light and considerable work is being held up. An Ohio wheel manufacturer has placed 120 tons of plates for rims for car wheels for use on Cuban sugar plantations and a boiler shop is inquiring for 560 tons of plates. Prices show virtually no change. Steel bars and structural material are firm at 2.15c. and plates range from 2c. to 2.15c., the latter being the common price. Prices on hot-rolled strip steel for wide material are very irregular, with some quotations as low as 2.25c. to meet the competition of light plates, and with 2.50c. as the common maximum. This material in narrow widths ranges from 2.65c. to 2.75c.

Jobbers quote steel bars, 3.21c.; plates and structural shapes, 3.31c.; No. 28 black sheets, 4.45c.; No. 28 galvanized sheets, 5.55c.; No. 10 blue annealed sheets, 3.55c. to 3.76c.; cold-rolled rounds, 4.10c.; flats, squares and hexagons, 4.60c.; hoops and bands, 1 in. and wider and 20 gage or heavier, 3.96c.; narrower than 1 in. or lighter than No. 20 gage, 4.46c.; No. 9 annealed wire, \$3.30 per 100 lb.; No. 9 galvanized wire, \$3.75 per 100 lb.; common wire nails, \$3.40 base per 100 lb.

Iron Ore.—Weakness has developed in the iron ore market, particularly on off grade ore. Ore in standard grades has been offered at some price concession but probably only by one or more small mining companies. At least attempts to secure verification of reports of shading on standard ore for this year's delivery by any of the leading producers have proved unsuccessful. However, some concessions are being made on short term contracts. When prices were established this year at a reduction of 80c. a ton, it was thought that new prices were so low that smaller mining companies that often cut under the regular market would not be inclined to go below the established prices. An inquiry from the American Radiator Co. for 200,000 tons of high phosphorus ore has led to keen competition. This company will buy ore for its blast furnace that will be ready for operation in September and is expecting to close a term contract. Several additional mines in the Lake Superior ore district have been shut down. Ore on Lake Erie docks July 1 amounted to 5,307,952 gross tons as compared with 4,890,946 tons on June 1 and with 4,511,791 tons on July 1 last year. Receipts at Lake Erie docks in June were 5,421,360 tons and for the season until July 1 they were 9,779,576 tons as compared with 11,437,482 tons up to July 1 last year. June shipments from these docks were 3,671,053 tons and to July 1 they were 8,355,215 tons as compared with 11,485,289 tons for the same period last year.

Pig Iron.—Sales held up well the past week, although the buying movement that has continued for a number of weeks has tapered off and not a great deal of new inquiry is pending. Further weakness has developed in spots in the price situation in that the \$19 Lake furnace price on foundry and malleable iron has been shaded in several cases for desirable lots for shipment to competitive points, the seller going low enough to more than absorb his freight differential as compared

with producers having lower freight rates, but the market is holding fairly firm at the \$19 Valley and Lake furnace price and with no change in the Cleveland price of \$20 for local delivery. The market situation is good from the standpoint of orders on the books and producers are now more interested in whether the consumption will increase so that the iron under contract will be taken. So far this month there has been a fair gain in shipping orders over June. The outlook in the automotive industry is better and one leading Michigan automobile company which has taken no iron for some time has commenced to release shipments. One local interest during the week sold 10,000 tons, another 12,000 tons and a third booked several good sized lots including one for over 5000 tons. Sales in the northern Ohio territory were light, but one consumer bought 1500 tons of foundry iron and another Ohio foundry booked 2000 tons of malleable iron. A Muncie, Ind., foundry bought 1000 tons of malleable iron and another Indiana melter bought 1000 tons of the same grade, both lots going to Lake furnaces. A brokerage house has an inquiry out for 25,000 tons of basic iron for delivery over the remainder of the year, claiming to have a customer for this iron, and a scrap dealer is inquiring for 6000 tons of basic iron. The Trumbull-Cliffs Furnace Co., Warren, blew in its furnace July 9.

Quotations below, except on basic and low phosphorus iron, are delivered Cleveland, and for local iron include a 50c. switching charge. Ohio silvery and Southern iron prices are based on a \$3.02 freight rate from Jackson and \$6 rate from Birmingham:

Basic, Valley furnace.....	\$19.00
N'th'n No. 2 fdy., sil. 1.75 to 2.25	20.00
Southern fdy., sil. 1.75 to 2.25...	24.00
Malleable	20.00
Ohio silvery, 8 per cent.....	33.52
Stand. low phos., Valley furnace..	\$27.00 to 27.50

Semi-Finished Steel.—Some good specifications have been placed against sheet bar contracts carried over for the second quarter, but recent inquiries have not resulted in sales. This indicates that the purpose of the inquiry was to attempt to develop lower prices that are demanded by mills that are not self-contained. The market is weak without sales to establish prices. However, slabs have been offered at \$35. The McKinney Steel Co. has started an additional open-hearth furnace and will add two more this week, making ten in operation.

Reinforcing Bars.—There is fair volume of inquiry for small lots. While 2c. is the common price on rail steel bars, some business is being taken at 1.90c., although some mills are inclined to stiffen up somewhat owing to the advance on old rails. Billet steel bars are unchanged at 2.15c.

Sheets.—The improvement in sheet orders that developed at the first of the month has not been maintained and the demand is exceedingly dull. Prices are holding at recent levels with black sheets at 3.50c. to 3.65c., blue annealed sheets at 2.75c. and galvanized at 4.75c.

Alloy Steel.—Owing to some buying by automobile companies that are bringing out new models, sales and production have increased. The Central Steel Co., Massillon, has put on two open-hearth furnaces, now operating six out of seven. Competition is very keen and the maximum quotations under the recent price revisions are expected to become general. Quotations down to 4.50c. are reported on 3½ nickel steel.

Bolts, Nuts and Rivets.—The demand for bolts and nuts continues light and while some manufacturers are getting a fair volume of orders, they are for very small lots. Competition is very keen for the little business that is coming out and some manufacturers are shading prices 5 to 10 per cent. Rivets also are weak, concessions of \$1 to \$2 a ton from the regular 2.60c. price being reported.

Coke.—Two makers of premium price coke have reduced their price on Connellsville foundry coke 50c. a ton to \$5.50. Other standard makes are quoted at \$4.50. The market is dull. The Trumbull-Cliffs Furnace Co. has started up its by-product coke ovens and will have some surplus coke to place on the market.

Old Material.—Prices have advanced 75c. a ton on heavy melting steel, \$1 on turnings, 50c. on borings and 25 to 50c. a ton on a number of other grades and the

market is firm at the new levels. The only consumer activity during the week was the purchase of heavy melting steel by a Youngstown mill and dealers are paying \$17 for this grade to fill the Youngstown contract. None of the local mills is in the market. It is estimated that scrap production has fallen 50 per cent and as high as 75 per cent for some grades, so that with the material that dealers have bought for yard stocks the supply for consumption is not in excess of the demand. In view of the narrow spread between pig iron and scrap prices, some in the trade doubt whether present prices on scrap are holding.

We quote dealers' prices f.o.b. Cleveland per gross ton:

Heavy melting steel.....	\$14.75 to \$15.00
Rails for rolling.....	15.50 to 16.00
Rails under 3 ft.....	16.25 to 16.75
Low phosphorus melting.....	16.75 to 17.00
Cast iron borings.....	13.50 to 13.75
Machine shop turnings.....	13.00 to 13.25
Mixed borings and short turnings.....	13.25 to 13.50
Compressed sheet steel.....	12.25 to 12.50
Railroad wrought.....	12.00 to 12.25
Railroad malleable.....	17.25 to 17.50
Light bundled sheet stampings.....	11.50 to 12.00
Steel axle turnings.....	13.25 to 13.75
No. 1 cast.....	20.00 to 20.50
No. 1 busheling.....	13.00 to 13.25
Drop forge flashings.....	11.00 to 11.50
Railroad grate bars.....	13.50 to 13.75
Stove plate.....	13.25 to 13.50
Pipes and flues.....	10.50 to 11.00

San Francisco

Fair Demand for Structural Steel—General Conditions Are Dull

SAN FRANCISCO, July 9.—The market for iron and steel is experiencing a period of dullness which bids fair to continue through the summer if present indications can be accepted as a guide to the near future. Some lines are less quiet than others and this fact is an outstanding feature of encouragement. New construction, wherein iron and steel figure largely, seems to be for the time being a sort of mainstay for the business and buying for the completion of current work as well as many contracts awarded but not yet started will support a trade movement that is good for many weeks to come. The dullness is more noticeable in the paucity of new orders being booked and dealers say this has been particularly accentuated during the last two weeks. It attracted some attention a month or more ago, but at the time it was not expected to develop its present proportions. Those most closely in touch with the trade situation say it is doubtful whether the inactivity will be anything more than what may be termed the usual summer quiet. There is an enormous amount of new construction planned in the central and southern counties of the State, and while there is a certain measure of backwardness in asking for bids, the delay is merely incidental because the work is fully planned and will be a reality. It is estimated that this new construction work will require not less than 35,000 tons of iron and steel and much of it will be ordered during the coming four months.

Pig Iron.—The importation of iron from abroad, largely from continental Europe, still continues of liberal proportions, and it appears to meet with ready sale, although prices have receded slightly during the last two weeks or so. Belgian and French pig iron can now be bought for \$27 to \$27.50 per ton, and an exceptionally high grade lot might bring \$28, but the bulk of business now in progress is close to the lowest figure mentioned. For desirable lots of English and Scotch iron, importers are still quoting from \$30 to \$31 per ton, but it is stated that these figures are being shaded in some instances. The report is current that largely increased importations of Chinese iron may be expected before the close of the year, and that tonnage arrangements for that particular purpose are now nearly completed.

Coke.—Comparative quiet seems to rule the market and sales are mostly in small lots. Arrivals have been large during the last few months, but it has moved off well and there are no undue accumulations. There is also a considerable tonnage now on the way. Prices

remain about the same as two weeks ago; that is, \$18 per ton. There has been some slight shading of this figure, but the sale is said to have been based on special conditions which warranted the variation. The present demand is very moderate but appropriate to this time of the year. Domestic coke meets with the usual inquiry for certain specific uses, but the sales have been light for two or three weeks.

Finished Iron and Steel.—Various opinions are expressed by dealers, some saying that trade is very dull, while others are more optimistic in their ideas. As a matter of fact, it is dull in some lines, with buying closely confined within narrow limits. Sales of merchant bars are somewhat restricted and prices are a shade easier. The demand for structural shapes continues with awards during the last two weeks aggregating a little more than 4200 tons, mostly for the bay district. Reports from Los Angeles say that awards there totaled over 9500 tons during the last half of June. Prices in this city are a trifle weaker and 2.60c. represents the general average. Wire is selling well, with prices held steady. There has been an inquiry from Tacoma for 106 tons of plates, but the award has not yet been made. While 2.60c. has been fairly well sustained as a selling figure, one and possibly two round lots have been placed at 2.55c. A 40-ton lot of rivets was a feature of the export trade, the bulk of it going to Victoria. There is a good demand for nails and prices are firmly held.

Old Material.—Business remains very quiet, with scarcely any variation worthy of note for some weeks. Heavy melting grades are quotable at \$12, but buyers say this figure can be shaded 50c. for a round lot. Supplies in the hands of consumers are said to be getting low and some improvement in trade is expected in the near future. Advices from Los Angeles indicate that business there is very dull with supplies liberal and sellers offering freely at \$11 to \$11.50 per ton, with considerable hesitancy on the part of buyers in taking anything except very small lots.

Diesel Engines for U. S. Ships

WASHINGTON, July 16.—Slow speed direct connected engines of proved type, according to a statement issued by Chairman O'Connor of the United States Shipping Board, will be used as its first step in converting Shipping Board vessels to Diesel propulsion. Unanimous recommendation to this end was made by the advisory committee appointed by Commissioner Benson. The initial conversion program comprises 12 large single-screw freighters.

The statement of Chairman O'Connor followed a denial by the board that manufacturers of double-action engines had made formal protest to the board on the ground that such type of engines would be ignored in connection with the Diesel engine installation program under the act of Congress authorizing the use of \$25,000,000 for that purpose. In a statement made public yesterday, Chairman O'Connor said:

"While recommending well tried engines for immediate installation, the committee pointed out the desirability of encouraging the development of the double-acting engine, and in view of its great advantages there is no doubt this type will receive due consideration in the near future. Plans and specifications are now in the course of preparation and it is intended to place contracts as rapidly as possible."

Manganese Ore Imports in Second Quarter

Imports of manganese ore in the second quarter of this year increased more than 40 per cent compared with first quarter imports, according to statistics compiled by the Iron & Ore Corporation of America, 11 Broadway, New York. A total of 150,487 gross tons of manganese ore was received from all countries in the second quarter, compared with 107,152 gross tons in the first quarter. The second quarter tonnage was made up as follows: Caucasus, 45,523 gross tons; Brazil, 38,650 gross tons; India, 31,385 gross tons; Africa, 26,179 gross tons; all other, 8750 gross tons.

Philadelphia

Change, if Any, in Steel Business Is in Direction of Improvement

PHILADELPHIA, July 15.—Some of the lighter forms of finished steel, in which there has been a fair degree of price stability, have been the first to be affected favorably by the improved buying sentiment of the past two weeks. Inquiries and orders for strip steel, hoops and bands, tin plate and sheets have improved, but the extent of the improvement is small and cannot yet be measured in any very definite way. It is difficult to point to any particular change in the demand for plates and bars, but shapes have been in better demand. While it is difficult to fix any particular time as representing the low point of steel buying and production in the East, it is reasonably certain that conditions, and particularly buying sentiment, have been slightly on the upgrade since the resumption following the Fourth of July shutdowns. Mills look for better buying, but admit that real improvement will come about very gradually.

Pig Iron.—Except that production of pig iron in the East has dropped to such a low point that slight inroads are being made on stocks, there is nothing very promising in the pig iron situation from the point of view of producers. Consumers apparently have become convinced that the recent third quarter buying movement is not going to result in any early advances in prices, and consequently some of the buying interest of the past two or three weeks has subsided, leaving the market very quiet. There is nothing in the situation to warrant any expectation of a change in prices within the near future either one way or the other. The tendency of producers is to stiffen their quotations slightly, and this may be done, but the change will be unimportant. At present most of the furnaces are quoting \$20.50, furnace, on No. 2 plain and \$21, furnace, on No. 2X, these prices predominating on current sales. However, large tonnages are apt to be taken at 50c. a ton under these prices. Very little business of importance has been closed within the week. The Pennsylvania Railroad bought a few thousand tons of foundry iron, but details were withheld.

The following quotations are, with the exception of those on low phosphorus iron, for delivery at Philadelphia and include freight rates varying from 76c. to \$1.63 per gross ton:

East. Pa. No. 2 plain, 1.75 to 2.25 sil.	\$20.76 to \$22.13
East. Pa. No. 2X, 2.25 to 2.75 sil.	21.26 to 22.63
East. Pa. No. 1X.	21.76 to 23.13
Virginia No. 2 plain, 1.75 to 2.25 sil.	30.17 to 31.17
Virginia No. 2X, 2.25 to 2.75 sil.	30.67 to 31.67
Basic delivered eastern Pa.	20.00 to 21.00
Gray forge	21.00 to 22.00
Malleable	22.00 to 22.50
Standard low phos. (f.o.b. furnace)	24.00 to 25.00
Copper bearing low phos. (f.o.b. furnace)	24.00 to 25.00

Ferroalloys.—The first definite change in the price of ferromanganese in some time comes in the announcement that a domestic producer, not recently an active seller, is making offers at \$105, seaboard, which is \$2.50 per ton less than other sellers, domestic and foreign, have been naming in recent months. Some low-priced offers of 50 per cent ferrosilicon have been made, \$70 having been quoted on a resale lot with the understanding that \$68 would be accepted on an order of sufficient size.

Semi-Finished Steel.—Mills quote \$38 for rerolling billets and \$43 for forging billets, both Pittsburgh base, but there is very little business, and prices are untested.

Plates.—Eastern plate mills are still running along on hand-to-mouth business, scarcely knowing this week what their schedules for next week will be. Most of them are doing about 40 per cent on the average, although occasional spurts of activity carry them above this operation for brief periods. Rolling schedules are being kept as flexible as possible, as buyers all want immediate shipment and the mill promising the best delivery often gets the order. Prices are virtually un-

changed, open quotations being 1.85c. to 2c., Pittsburgh, with indications that mills would go as low as 1.80c. on desirable lots.

Structural Material.—Bids close this week on a new power station for the Philadelphia Electric Co., requiring 8300 tons, mostly silicon steel. Bids also close this week on the Philadelphia subways and the Delaware River bridge, which call for a combined tonnage of close to 35,000. Demand for plain material continues to show improvement. Eastern mills are getting a better volume of orders and prices seem to be a little less unsteady. Eastern mills continue to quote 2c., Pittsburgh, with the possibility that concessions would be given on tonnages of more than ordinary attractiveness.

Bars.—Mills have not experienced any important change in the demand for steel bars. Inquiries are possibly a trifle better, but orders continue in small volume. Most of the mills quote 2.15c., Pittsburgh. Bar iron is in light demand, with Eastern mills quoting 2.10c., Pittsburgh.

Sheets.—Specifications for sheets have come in at a little better rate. The leading independent maker of blue annealed sheets in this district reports an improvement that is noticeable, though not large. Prices are unchanged, and show a spread of \$1 to \$3 a ton as between different mills.

Warehouse Business.—A large steel jobbing house did last week the largest volume of business in some months. Jobbers' prices are unchanged, and for local delivery are as follows:

Soft steel bars and small shapes, 3.35c.; iron bars (except bands), 3.35c.; round edge iron, 3.50c.; round edge steel, iron finished, 1½ x ½ in., 3.50c.; round edge steel planished, 4.30c.; tank steel plates, ¼ in. and heavier, 3.35c.; tank steel plates, ½ in., 3.60c.; blue annealed steel sheets, No. 10 gage, 3.90c.; black sheets, No. 28 gage, 4.95c.; galvanized sheets, No. 28 gage, 6c.; square twisted and deformed steel bars, 3.35c.; structural shapes, 3.45c.; diamond pattern plates, ¼ in., 5.30c.; ½ in., 5.50c.; spring steel, 5c.; round cold-rolled steel, 4.35c.; squares and hexagons, cold-rolled steel, 4.85c.; steel hoops, 1 in. and wider, No. 20 gage and heavier, 4.10c.; narrower than 1 in., all gages, 4.60c.; steel bands, No. 12 gage to ¼ in., inclusive, 4.10c.; rails, 3.35c.; tool steel, 8.50c.; Norway iron, 7c.

Old Material.—A peculiar situation exists in the scrap market, particularly with relation to heavy melting steel. One large consumer has not paid above \$14.50 or \$15, delivered, although it is understood that no purchases at either of these figures have been made within the past week. On the other hand, a smaller steel plant, which came into the market last week, was able to buy a few small lots at \$15.50, then had to pay \$16 and indications today were that it had not been able to purchase as much as it wanted at either figure, and probably would be obliged to offer \$16.50. There has not been enough buying to give real strength to the market, and yet the minds of dealers and brokers are so firmly fixed upon the idea that prices must go higher that they hesitate to contract for large tonnages in the belief that they would not be able to "cover" at a profit. Prices are higher this week on several grades.

We quote for delivery at consuming points in this district as follows:

No. 1 heavy melting steel	\$15.50 to \$16.00
Scrap rails	15.50 to 16.00
Steel rails for rolling	17.50 to 18.00
No. 1 low phos., heavy 0.04 and under	19.00 to 20.00
Couplers and knuckles	19.50 to 20.00
Cast-iron car wheels	17.50 to 18.00
Rolled steel wheels	19.50 to 20.00
No. 1 railroad wrought	18.00 to 18.50
No. 1 yard wrought	16.00 to 16.50
No. 1 forge fire	13.50 to 14.00
Bundled sheets (for steel works)	13.00 to 13.50
Mixed borings and turnings (for blast furnace use)	11.00 to 11.50
Machine shop turnings (for steel works use)	13.00 to 13.50
Machine shop turnings (for rolling mill use)	13.00 to 13.50
Heavy axle turnings (or equivalent)	15.50 to 16.00
Cast borings (for steel works and rolling mills)	13.50 to 14.00
Cast borings (for chemical plants)	14.00 to 14.50
No. 1 cast	18.00 to 18.50
Heavy breakable cast (for steel plants)	16.00 to 16.50
Railroad grate bars	14.50 to 15.00
Stove plate (for steel plant use)	14.50 to 15.00
Wrought iron and soft steel pipes and tubes (new specifications)	15.50 to 16.00
Shafting	23.50 to 24.50
Steel axles	21.00 to 22.00

FABRICATED STEEL BUSINESS

Mid-Summer Letting of Structural Work Is in Fairly Good Volume

Lettings of structural steel work in the past week compare very favorably with some of the most active weeks of the year, the total for the week, as reported to THE IRON AGE, being more than 26,000 tons. Pending work totals upward of 22,000 tons. These figures reflect a state of activity in structural steel that lifts it out of the dullness which prevails in the demand for other steel products.

Hospital, Mount Vernon, N. Y., 250 tons, to American Bridge Co.

Highway bridge in New Jersey, 300 tons, to Bethlehem Steel Co.

Westinghouse Electric & Mfg. Co., power plant at Springfield, Mass., 200 tons, to a Springfield fabricator.

Erie Railroad, bridge, 200 tons, to American Bridge Co.

Bloomington Brothers, New York, addition to department store, 1300 tons, to unnamed fabricator.

City of New York, Public School No. 19, 900 tons, to A. E. Norton, Inc.; Public School No. 73, 500 tons, to McClintic-Marshall Co.; Teachers' Manual Training School, 2000 tons, to Hedden Iron Construction Co.

City of New York, transit work, 600 tons, to American Bridge Co.

Long Island Railroad, building, 225 tons, to Shoemaker Bridge Co.

C. Pardee Works, Perth Amboy, N. J., addition, 200 tons, to Belmont Iron Works.

Harvard Bridge, Boston-Cambridge, repair work, 1300 tons, to Boston Bridge Works.

Keith's Theater, Siegel Building, Boston, 350 tons beams and columns to New England Structural Co. and 500 tons trusses and columns, to American Bridge Co.

Beacon Mfg. Co., Swannanoa, N. C., mill, 800 tons, to Virginia Bridge & Iron Works.

Cleveland Electric Illuminating Co., boiler house, 2600 tons, to American Bridge Co.

First National Bank, Blairsville, Pa., banking house, 200 tons, to Jones & Laughlin Steel Corporation.

Citizens Title & Trust Co., Uniontown, Pa., banking house, 250 tons, to Jones & Laughlin Steel Corporation.

Northern Refrigerator Car Co., Cudahy, Wis., shop addition, 100 tons, to Worden-Allen Co.

Louisville & Nashville Railroad, shops at Corbin, Ky., 350 tons, to International Steel & Iron Co.

State of Ohio, highway bridges, 270 tons, to Brookville Bridge Co.

Two garages at Huntington, W. Va., 400 tons, to unnamed fabricators.

Third National Bank Building, Dayton, Ohio, addition, 1500 tons, McClintic-Marshall Co. low bidder. Work to be awarded about July 16.

Union League Club, building, Chicago, 5000 tons, to American Bridge Co.

Wabash Railway, West Fort Street grade separation, Detroit, 370 tons, to American Bridge Co.

Commonwealth Steel Co., Granite City, Ill., structural steel for No. 6 open hearth furnace, 100 tons, and extension to No. 7 finishing building, 160 tons, both to an independent fabricator.

Rock Island Lines, extension to Western Avenue subway, Blue Island, Ill., 102 tons, to McClintic-Marshall Co.

Michigan Bell Telephone Co., Lenox Exchange, Detroit, 450 tons, to unnamed fabricator.

Michigan Central Railroad, Fort Street bridge, Detroit, 815 tons, to McClintic-Marshall Co.

Whitehill Building, Indianapolis, 600 tons, to Rochester Bridge Co.

Sawyer Amusement Co., theater, store and apartment building, Chicago, 900 tons, to Milwaukee Bridge Co.

International Harvester Co., casting machine, cast and ladle house, South Chicago, 280 tons, to American Bridge Co.

Minnesota Highway Department, bridges at Campbell and Sauk Center, Minn., 168 tons, to American Bridge Co. Magnolia Petroleum Co., 6 oil storage tanks, 1500 tons, to United Iron Works.

Hydroelectric Power Commission, Toronto, Ont., 300,000 cu. ft. gas holder, 400 tons, to Horton Steel Works, Bridgeburg, Ont.

Two apartment buildings on Riverside Drive, New York, for Samuel Golding, 2400 tons, to Harris Structural Steel Co.

New York Edison Co., distributing station on Twenty-second Street, New York, 400 tons, to Hedden Iron Construction Co.

Apartment house on Lexington Avenue and Seventy-third Street, New York, 900 tons, to Paterson Bridge Co.

City of New York, bridge in Bronx Park, 100 tons, to Bethlehem Steel Co.

Theater, Bronx, New York, 300 tons, to A. E. Norton, Inc.

Structural Projects Pending

Inquiries for fabricated steel work include the following:

Philadelphia Electric Co., Richmond power station, Philadelphia, 8300 tons, mostly silicon steel; bids close July 16.

Hotel Haddon Hall, Atlantic City, N. J., extension, 500 tons.

Hotel Chalfonte, Atlantic City, N. J., stores and pavilions, 100 tons.

Boston Elevated Railroad, garage, 150 tons.

R. H. Macy & Co., New York, warehouse in Mount Vernon, N. Y., 100 tons.

Museum of Natural History, New York, extension, 500 tons.

New Jersey Zinc Co., plant at Palmerton, N. J., 500 tons.

Ahlstrom & Enholm, Neponsit, Quincy, Mass., woodworking shop, 120 tons.

Union Indemnity Building, New Orleans, 1500 tons, bids being taken.

Pritchard Hotel, Huntington, W. Va., 350 tons, bids close July 21.

Chicago, Indianapolis & Louisville, bridge work at Indianapolis, 300 tons, bids being taken.

Big Four Railroad, Market Street, subway, Indianapolis, 215 tons, bids close July 22.

Grandstand for new race track near Cincinnati, 150 tons, bids being taken.

Standard Club, building, Chicago, 3000 tons, Albert Kahn, Detroit, architect.

Cleveland, power plant, 2500 tons.

Detroit, warehouse, 1100 tons.

Superior Oil Co., oil storage tanks, 1000 tons.

Hoofer Oil Co., tanks, 800 tons.

Skelly Oil Co., tanks, 600 tons.

Joseph Laronge, office and store building, Cleveland, 150 tons.

New York, Chicago & St. Louis, bridge, Cleveland, 150 tons.

RAILROAD EQUIPMENT BUYING

American Car Builders Come Close to European Companies on Competitive Bids

In the absence of domestic business, American car builders have been trying to get orders abroad. Domestic roads have not bought any new cars in the past week, but orders have been placed for the repair of about 700 cars. Pending inquiries are extremely light.

American car builders are now figuring very closely in competition with European car builders on foreign car inquiries. The margin between British and American bids on 200 flat cars for the Nitrate Railways of Chile is said to have been very slight, but the order went to the Metropolitan Carriage, Wagon & Finance Co. of London.

The Cambria & Indiana Railroad has contracted with the American Car & Foundry Co. for the rebuilding of 300 50-ton hopper cars.

The Chesapeake & Ohio has placed repairs on 500 gondola cars with the Logan, Ohio, shops of the Hocking Valley, its subsidiary.

The Maine Central is inquiring for 250 box cars.

The Great Northern will build 100 underframes in its own shops.

STRUCTURAL BOOKINGS IN JUNE

Exceed May, 1924, and June, 1923—Half Year Little Under Corresponding Half of 1924

Sales of fabricated structural steel in June, reported by 161 firms with a capacity of 237,395 tons, amounted to 156,575 tons, representing 66 per cent of capacity, according to the Bureau of Census. Computed total bookings in June totaled 171,600 tons. Shipments aggregated 202,800 tons, or 78 per cent of capacity.

Revised figures for May show bookings of 145,339 tons, reported by 186 firms with a capacity of 244,665 tons, representing 59 per cent of capacity. Computed bookings for May amounted to 153,400 tons, while shipments were 184,600 tons, or 71 per cent of capacity.

Bookings for June, 1923, were 130,000 tons. The total for the first half of 1924 amounts to 1,050,000 tons, against 1,115,000 tons for the first half of 1923.

Prices Finished Iron and Steel f.o.b. Pittsburgh

Carload Lots

Plates

Sheared, tank quality, base, per lb.....2.15c.

Structural Materials

Beams, channels, etc., base, per lb.....2.15c.
Sheet piling2.25c. to 2.30c.

Iron and Steel Bars

Soft steel bars, base, per lb.....2.15c.
Soft steel bars for cold finishing.....\$3 per ton over base
Reinforcing steel bars, base.....2.15c.
Refined iron bars, base, per lb......3c.
Double refined iron bars, base, per lb.....4.50c. to 4.75c.
Stay bolt iron bars, base, per lb.....6.50c. to 7.00c.

Hot-Rolled Flats

Hoops, base, per lb.....2.60c.
Bands, base, per lb.....2.60c.
Strips, base, per lb.....2.50c. to 2.60c.

Cold-Finished Steel

Bars and shafting, drawn or rolled, base, per lb.....2.80c.
Bars and shafting, drawn or rolled, l.c.l., per lb.....3.05c.
Shafting, turned and polished, base, per lb.....2.80c.
Bars, S. A. E. Series, No. 2100.....4.50c. to 4.75c.
Bars, S. A. E. Series, No. 2300.....6.00c. to 6.25c.
Bars, S. A. E. Series, No. 3100.....5.00c. to 5.25c.
Strips, base, per lb.....4.25c. to 4.50c.

Wire Products

(To jobbers in car lots)

Nails, base, per keg.....\$2.90
Galvanized nails, 1 in. and over.....\$2.25 over base
Galvanized nails, less than 1 in.....2.50 over base
Bright plain wire, base, No. 9 gage, per 100 lb.....\$2.65
Annealed fence wire, base, per 100 lb.....2.80
Spring wire, base, per 100 lb.....3.70
Galvanized wire No. 9, base, per 100 lb.....3.25
Galvanized barbed, base, per 100 lb.....3.70
Galvanized staples, base, per keg.....3.70
Painted barbed wire, base, per 100 lb.....3.35
Polished staples, base, per keg.....3.35
Cement coated nails, base, per count keg.....\$2.25 to 2.30
Bale ties, carloads to jobbers...75, 5, 5 and 2 1/2 per cent off list
Woven fence, carloads (to jobbers).....70 per cent off list
Woven fence, carloads (to retailers).....67 1/2 per cent off list

Bolts and Nuts

Machine bolts, small, rolled threads.....60, 20 and 10 per cent off list
Machine bolts, all sizes, cut threads...60 and 20 per cent off list
Carriage bolts, 1/2 x 6 in.:
Smaller and shorter, rolled threads...60 and 20 per cent off list
Carriage bolts, cut threads, all sizes...60 and 10 per cent off list
Lag bolts65 and 10 per cent off list
Flow bolts, Nos. 1, 2 and 3 heads...50 and 10 per cent off list
Other style heads.....20 per cent extra
Machine bolts, c.p.c. and t. nuts, 1/2 x 4 in.:
50, 10 and 10 per cent off list
Larger and longer sizes.....50, 10 and 10 per cent off list
Hot pressed squares or hex. nuts, blank.....5c. off list
Hot pressed nuts, tapped.....5c. off list
C.p.c. and t. square or hex. nuts, blank.....4.50c.
C.p.c. and t. square or hex. nuts, tapped.....4.50c.
Semi-finished hex. nuts:
1/2 in. and smaller, U. S. S.....80, 10 and 5 per cent off list
1/2 in. and larger, U. S. S.....75, 10 and 5 per cent off list
Small sizes, S. A. E.....80, 10 and 5 per cent off list
S. A. E., 1/2 in. and larger.....75, 10 and 5 per cent off list
Stove bolts in packages.....80, 10 and 5 per cent off list
Stove bolts in bulk.....80, 10, 5 and 2 1/2 per cent off list
Tire bolts60 and 10 per cent off list
Bolt ends with hot pressed nuts.....60 and 5 per cent off list
Bolt ends with cold pressed nuts.....50 and 5 per cent off list
Turnbuckles, with ends, 1/2 in. and smaller, 55 and 5 per cent off list
Turnbuckles, without ends, 1/2 in. and smaller, 70 and 10 per cent off list
Washers5.75c. to 6.00c.
Lock washers80 per cent off list

Semi-Finished Castellated and Slotted Nuts

(To jobbers and consumers in large quantities f.o.b. Pittsburgh.)

Per 1000		Per 1000	
S. A. E.	U. S. S.	S. A. E.	U. S. S.
1/4-in.	\$4.25	1/4-in.	\$13.25
3/8-in.	4.90	3/8-in.	16.25
1/2-in.	5.90	1/2-in.	22.50
3/4-in.	7.50	3/4-in.	34.00
1-in.	9.75	1-in.	53.00

Larger sizes—Prices on application.

Cap and Set Screws

Milled hex. head cap screws.....75, 10 and 5 per cent off list
Milled standard set screws, case hardened, 75, 10 and 5 per cent off list
Milled headless set screws, cut thread, 75, 10 and 5 per cent off list
Upset hex. head cap screws, U. S. S. thread, 80, 10 and 10 per cent off list
Upset hex. head cap screws, S. A. E. thread, 80, 10 and 10 per cent off list
Milled studs65 and 10 per cent off list

Rivets

Large structural and ship rivets, base, per 100 lb.....\$2.60
Small rivets70, 10 and 5 per cent off list

Track Equipment

Spikes, 1/2 in. and larger, base, per 100 lb.....\$2.90
Spikes, 1/2 in. and smaller, base, per 100 lb.....\$3.25 to 3.40
Spikes, boat and barge, base, per 100 lb.....3.25 to 3.40
Track bolts, all sizes, base, per 100 lb.....3.75 to 4.00
Tie plates, per 100 lb.....2.50 to 2.55
Angle bars, base, per 100 lb.....2.75

Welded Pipe

Butt Weld

Inches	Steel	Galv.	Inches	Iron	Galv.
1/4	45	19 1/2	1/4 to 3/8	+11	+39
1/2 to 3/4	51	25 1/2	1/2	22	2
1	56	42 1/2	3/4	28	11
1 1/4	60	48 1/2	1 to 1 1/4	30	13
1 to 3	62	50 1/2			

Lap Weld

2	55	43 1/2	2	23	7
2 1/2 to 6	59	47 1/2	2 1/2	26	11
7 and 8	56	43 1/2	3 to 6	28	13
9 and 10	54	41 1/2	7 to 12	26	11
11 and 12	53	40 1/2			

Butt Weld, extra strong, plain ends

1/4	41	24 1/2	2 to 3	61	50 1/2
1/2 to 3/4	47	30 1/2	3/4 to 1	+19	+54
1	53	42 1/2	1 1/4	21	7
1 1/4	58	47 1/2	1 1/2	28	12
1 to 1 1/4	60	49 1/2	1 to 1 1/4	30	14

Lap Weld, extra strong, plain ends

2	53	42	2	23	9
2 1/2 to 4	57	46 1/2	2 1/2 to 4	29	15
4 1/2 to 6	56	45 1/2	4 1/2 to 6	28	14
7 to 8	52	39 1/2	7 to 8	21	7
9 and 10	45	32 1/2	9 to 12	16	2
11 and 12	44	31 1/2			

To the large jobbing trade the above discounts are increased by one point, with supplementary discount of 5 per cent on black and 1 1/2 points, with a supplementary discount of 5 per cent on galvanized.

Boiler Tubes

Lap Welded Steel

2 to 2 1/2 in.	27
2 1/2 to 3 in.	37
3 in.	40
3 1/2 to 4 in.	42 1/2
4 to 13 in.	46

Charcoal Iron

1 1/2 in.	+18
1 1/2 to 1 3/4 in.	+8
2 to 2 1/2 in.	+2
2 1/2 to 3 in.	7
3 1/2 to 4 1/2 in.	9

Standard Commercial Seamless Boiler Tubes

Cold Drawn

1 in.	55	3 and 3 1/2 in.	36
1 1/4 and 1 1/2 in.	47	3 1/2 and 3 3/4 in.	37
1 1/2 in.	31	4 in.	41
2 and 2 1/2 in.	22	4 1/2 in. and 5 in.	33
2 1/2 and 3 in.	32		

Hot Rolled

3 and 3 1/2 in.	38	4 in.	43
3 1/2 in. and 3 3/4 in.	39		

Less carloads, 4 points less. Add \$8 per net ton for more than four gages heavier than standard. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be held at mechanical tube list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing

Carbon under 0.30, base.....87 per cent off list
Carbon 0.30 to 0.40, base.....85 per cent off list
Plus usual differentials and extras for cutting. Warehouse discounts range higher.

Seamless Locomotive and Superheater Tubes

Cents per Ft.		Cents per Ft.	
2-in. O.D. 12 gage....	15	2 1/2-in. O.D. 10 gage....	20
2-in. O.D. 11 gage....	16	3-in. O.D. 7 gage....	35
2-in. O.D. 10 gage....	17	1 1/2-in. O.D. 9 gage....	15
2 1/4-in. O.D. 12 gage....	17	5 1/2-in. O.D. 9 gage....	55
2 1/4-in. O.D. 11 gage....	18	5 1/2-in. O.D. 9 gage....	57

Tin Plate

Standard cokes, per base box.....\$5.50

Terne Plate

(Per Package, 20 x 28 in.)

8-lb. coating, 100 lb. base.....\$11.00	20-lb. coating I. C.....\$14.90
8-lb. coating I. C.....11.30	25-lb. coating I. C.....16.20
12-lb. coating I. C.....12.70	30-lb. coating I. C.....17.35
15-lb. coating I. C.....13.95	35-lb. coating I. C.....18.35
	40-lb. coating I. C.....19.35

Sheets

Blue Annealed

Nos. 9 and 10 (base), per lb.....2.70c. to 2.80c.
Box Annealed, One Pass Cold Rolled
No. 28 (base), per lb.....3.50c. to 3.65c.

Automobile Sheets

Regular auto body sheets, base (22 gage), per lb., 5.10c.
Galvanized
No. 28 (base), per lb.....4.60c. to 4.80c.

Long Ternes

No. 28 gage (base), 8-lb. coating, per lb.....5.30c.
Tin-Mill Black Plate
No. 28 (base), per lb.....3.50c. to 3.65c.

Prices of Raw Materials, Semi-Finished and Finished Products

Ores

Lake Superior Ores, Delivered Lower Lake Ports

Old range Bessemer, 55 per cent iron.....	\$5.65
Old range non-Bessemer, 51½ per cent iron.....	4.90
Mesabi Bessemer, 55 per cent iron.....	5.40
Mesabi non-Bessemer, 51½ per cent iron.....	4.75

Foreign Ore, per Unit, c.i.f. Philadelphia or Baltimore

Iron ore, low phos., copper free, 55 to 58 per cent iron in dry Spanish or Algerian.....	9.00c. to 9.50c.
Iron ore, Swedish, average 66 per cent iron..	9.50c.
Manganese ore, washed, 51 per cent manganese, from the Caucasus, nominal.....	45c.
Manganese ore, ordinary, 48 per cent manganese, from the Caucasus.....	43c.
Manganese ore, Brazilian or Indian, nominal Tungsten ore, per unit, in 60 per cent concentrates	42c.
Chrome ore, basic, 48 per cent Cr ₂ O ₃ , crude, per ton, c.i.f. Atlantic seaboard.....	\$8.75 to \$10.00
Molybdenum ore, 85 per cent concentrates, per lb. of MoS ₃ , New York.....	19.00 to 22.00
	75c. to 85c.

Ferroalloys

Ferromanganese, domestic, 80 per cent, furnace, or seaboard, per ton.....	\$107.50
Ferromanganese, British, 80 per cent f.o.b. Atlantic port, duty paid.....	107.50
Ferrosilicon, 50 per cent, delivered.....	\$72.00 to 75.00
Ferrosilicon, 75 per cent.....	140.00
Ferrotungsten, per lb. contained metal.....	90c. to 93c.
Ferrochromium, 4 to 6 per cent carbon, 60 to 70 per cent Cr. per lb. contained Cr. delivered	10.75c.
Ferrochromium, 6 to 7 per cent carbon, 60 to 70 per cent Cr., per lb.....	10.50c.
Ferrovanadium, per lb. contained vanadium	\$3.50 to \$4.00
Ferrocobaltititanium, 15 to 18 per cent, per net ton	200.00

Spiegeleisen, Bessemer Ferrosilicon and Silvery Iron

(Per gross ton furnace unless otherwise stated)

Spiegeleisen, domestic, 19 to 21 per cent.....	\$35.00
Spiegeleisen, domestic, 16 to 19 per cent.....	34.00
Ferrosilicon, Bessemer, 10 per cent, \$39.50; 11 per cent, \$42.12 per cent, \$43.50; 14 to 16 per cent (electric furnace), \$40.00.	
Silvery iron, 5 per cent, \$27.00; 6 per cent, \$28.00; 7 per cent, \$29.00; 8 per cent, \$30.50; 9 per cent, \$32.50; 10 per cent, \$34.50; 11 per cent, \$37.00; 12 per cent, \$39.50.	

Fluxes and Refractories

Fluorspar, 80 per cent and over calcium fluoride, not over 5 per cent silica, per net ton f.o.b. Illinois and Kentucky mines....	\$19.00 to \$22.00
Fluorspar, 85 per cent and over calcium fluoride, not over 5 per cent silica, per net ton f.o.b. Illinois and Kentucky mines....	21.00 to 23.50
Per 1000 f.o.b. works:	
Fire Clay:	
Pennsylvania	High Duty \$40.00 to \$43.00 Moderate Duty \$27.00 to \$40.00
Maryland	45.00 to 47.00 40.00 to 42.00
Ohio	40.00 to 43.00 37.00 to 39.00
Kentucky	42.00 to 43.00 37.00 to 39.00
Illinois	37.00 to 42.00
Missouri	42.00 to 45.00 35.00 to 40.00
Ground fire clay, per net ton.....	6.00 to 7.00
Silica Brick:	
Pennsylvania	35.00 to 38.00
Chicago	47.00
Birmingham	50.00
Ground silica clay, per net ton.....	7.50 to 9.00
Magnesite Brick:	
Standard size, per net ton (f.o.b. Baltimore and Chester, Pa.).....	65.00
Grain magnesite, per net ton (f.o.b. Baltimore and Chester, Pa.).....	40.00
Chrome Brick:	
Standard size, per net ton.....	45.00

Semi-Finished Steel, F.O.B. Pittsburgh or Youngstown, per gross ton

Rolling billets, 4-in. and over.....	\$38.00
Rolling billets, 2-in. and under.....	38.00
Forging billets, ordinary carbons.....	43.00
Sheet bars, Bessemer	\$38.00 to 40.00
Sheet bars, open-hearth.....	38.00 to 40.00
Slabs	35.00
Wire rods, common soft, base, No. 5 to ¼-in.....	\$43.00
Wire rods, common soft, coarser than ¼-in....	\$2.50 over base
Wire rods, screw stock.....	\$5.00 per ton over base
Wire rods, carbon, 0.20 to 0.40.....	3.00 per ton over base
Wire rods, carbon 0.41 to 0.55.....	5.00 per ton over base
Wire rods, carbon 0.56 to 0.75.....	7.50 per ton over base
Wire rods, carbon over 0.75.....	10.00 per ton over base
Wire rods, acid	15.00 per ton over base
Skelp, grooved, per lb.....	2.15c.
Skelp, sheared, per lb.....	2.15c.
Skelp, universal, per lb.....	2.15c.

Finished Iron and Steel, F.O.B. Mill

Rails, heavy, per gross ton.....	\$42.00
Rails, light, new steel, base, lb.....	1.90c.
Rails, light, rail steel, base, per lb.....	1.65c. to 1.75c.
Bars, common iron, base, per lb., Chicago mill	2.20c.
Bars, common iron, Pittsburgh mill.....	2.40c.
Bars, rail steel reinforcing, base, per lb.....	2.10c. to 2.15c.
Rail steel bars, base, per lb., Chicago mill....	2.10c.
Cold-finished steel bars, base, Chicago, per lb..	2.90c.
Ground shafting, base, per lb.....	3.30c.
Cut nails, base, per keg.....	\$2.90

Alloy Steel

S. A. E. Series Numbers	Bars 100 lb.
2100* (½% Nickel, 10 to 20 per cent Carbon)...	\$3.25 to \$3.50
2300 (¾% Nickel)	4.75 to 5.00
2500 (5% Nickel)	8.00 to 8.50
3100 (Nickel Chromium)	3.75 to 4.00
3200 (Nickel Chromium)	5.50 to 5.75
3300 (Nickel Chromium)	8.00
3400 (Nickel Chromium)	6.50 to 7.00
5100 (Chromium Steel)	3.25 to 3.75
5200* (Chromium Steel)	7.50 to 8.00
6100 (Chromium Vanadium bars).....	4.50 to 4.75
6100 (Chromium Vanadium spring steel).....	4.25 to 4.50
9250 (Silicon Manganese spring steel).....	3.50 to 3.75
Nickel Chrome Vanadium (0.60 Nickel, 0.50 Chromium, 0.15 Vanadium).....	4.25 to 4.50
Chromium Molybdenum bars (0.30—1.10 Chromium, 0.25—0.40 Molybdenum).....	4.35 to 4.50
Chromium Molybdenum bars (0.50—0.70 Chromium, 0.15—0.25 Molybdenum).....	3.85 to 4.25
Chromium Molybdenum spring steel (1—1.25 Chromium, 0.30—0.50 Molybdenum)	4.75 to 5.00

Above prices are for hot-rolled alloy steel bars, forging quality, per 100 lb., f.o.b. Pittsburgh. Billets 4 x 4 in. and larger are \$10 per gross ton less than net ton prices for bars of same analysis. On smaller than 4 x 4-in. billets the net ton bar price applies.

*Not S.A.E. specifications, but numbered by manufacturers to conform to S.A.E. system.

Freight Rates

All rail freight rates from Pittsburgh on finished iron and steel products, carload lots, 36,000 lb. minimum carload, per 100 lb.:

Philadelphia, domestic.....	\$0.32	Buffalo	\$0.265	St. Louis	\$0.43	*Pacific Coast	\$1.15
Philadelphia, export.....	0.235	**Cleveland	0.215	Kansas City	0.735	*Pac. Coast, ship plates 1.20	
Baltimore, domestic.....	0.31	**Cleveland, Youngs-		Kansas City (pipe)...	0.705	Birmingham	0.58
Baltimore, export.....	0.225	town Comb.	0.19	St. Paul	0.60	Memphis	0.56
New York, domestic.....	0.34	Detroit	0.29	Omaha	0.735	Jacksonville, all rail..	0.70
New York, export.....	0.255	Cincinnati	0.29	Omaha	0.705	Jacksonville, rail and	
Boston, domestic.....	0.365	Indianapolis	0.31	Denver	1.15	water	0.415
Boston, export.....	0.255	Chicago	0.34	†Denver (pipe)	1.17	New Orleans	0.67

*Applies minimum carload 80,000 lb. **There will be no official change until Sept. 20, but, as for some time, the 19c. rate prevails. †Minimum loading 46,000 lb.

Rates from Atlantic Coast ports (i.e., New York, Philadelphia and Baltimore) to Pacific Coast ports of call on most steamship lines, via the Panama Canal, are as follows: Pig iron, 35c.; ship plates, 40c.; ingots and muck bars, structural steel, common wire products, including cut or wire nails, spikes, and wire hoops, 40c.; sheets and tin plates, 40c.; sheets No. 12 gage and lighter, 50c.; rods, 40c.; wire rope cables and strands, 45c.; wire fencing, netting and stretcher, 40c.; pipes not over 12 in. in diameter, 55c.; over 12 in. in diameter, 2½c. per in. or fraction thereof additional. All rates per 100 lb. in carload lots, minimum 36,000 lb.

NON-FERROUS METALS

The Week's Prices

Cents per Pound for Early Delivery

	Copper, New York		Straits Tin (Spot)	Lead		Zinc	
	Lake	Electro-lytic*	New York	New York	St. Louis	New York	St. Louis
July							
9.....	12.50	12.00	43.25	7.00	6.65	6.15	5.80
10.....	12.50	12.00	43.25	7.00	6.65	6.15	5.85
11.....	12.62½	12.12½	44.00	7.00	6.65	6.15	5.85
12.....	12.62½	12.12½	....	7.00	6.65	6.15	5.85
14.....	12.62½	12.12½	45.00	7.00	6.65	6.15	5.85
15.....	12.62½	12.12½	45.25	7.00	6.65	6.15	5.85

*Refinery quotation; delivered price ¼c. higher.

New York

NEW YORK, July 15.

A degree of improvement has developed in the copper, zinc and tin markets, with lead quiet and unchanged. There has been better buying of copper and tin, and export demand for the former has shown decided signs of improvement.

Copper.—Within the last week the copper market has taken a slight turn for the better, prices being a shade firmer, and better demand is reported. One of the telegraph companies is in the market for 4,000,000 lb. for the remainder of the year and a wire mill is a possible purchaser of 1,000,000 to 2,000,000 lb. A Western wire mill is reported to have bought about this quantity. Export trade is reported to have improved generally, and while the orders are small, they are coming from a number of countries, Germany being a prominent buyer. Export prices on business done within the past few days were 12.45c. per lb., f.a.s., New York, for September shipment and 12.50c., f.a.s., for October shipment. Electrolytic copper is offered for prompt shipment at 12.37½c. per lb., delivered to nearby points. Lake copper is quoted at about 12.62½c.

Tin.—Although the week as a whole has been quiet, there was a slight burst of activity today (Tuesday) resulting in sales at 45c. to 45.25c. of about 300 tons, mostly to consumers, who entered the market for the first time in quite a period. On Monday and during last week consumers showed no interest except for the purchase of a few parcels of prompt tin. In general the situation is believed to be growing better, largely due to the fact that the large stocks here are moving into stronger hands, chiefly London houses, and it is expected that there will be fewer offerings of this surplus at discounts for prompt shipment. London quotations today were £226 5s. for spot standard; £227 15s. for future standard; £227 10s. for spot Straits. The Singapore price was £230 5s.

Lead.—While nothing has developed to give any strength to the lead market, the price remains fairly steady and the undertone is good. All sellers quote 7c. for delivery in the East, the St. Louis price remaining nominally at 6.65c.

Old Metals.—The market continues sluggish with not much change in values. Dealers' selling prices are as follows:

	Cents Per Lb.
Copper, heavy and crucible.....	12.00
Copper, heavy and wire.....	11.00
Copper, light and bottoms.....	10.00
Heavy machine composition.....	9.50
Brass, heavy.....	7.75
Brass, light.....	6.25
No. 1 red brass or composition turnings..	8.50
No. 1 yellow rod brass turnings.....	7.25
Lead, heavy.....	6.50
Lead, tea.....	5.25
Zinc.....	4.25
Cast aluminum.....	16.00
Sheet aluminum.....	16.50

Zinc.—Although prices are a shade stronger than a week ago, the zinc market has shown little, if any, change within the week. Business is quiet, but producers' ideas are somewhat firmer in tone. We quote 5.85c., St. Louis, and 6.15c., New York.

Antimony.—Quotations for Chinese metal are un-

changed at 8.25c. to 8.35c. per lb., New York, duty paid. Sales are light.

Aluminum.—Virgin metal, 98 to 99 per cent pure, is offered by importers at 26.50c. to 27c. per lb., duty paid, delivered.

Nickel.—Quotations on nickel are unchanged at 27c. to 32c. per lb. for shot and ingot. Electrolytic nickel is held at 30c. to 32c. by leading producers.

Chicago

JULY 15.—Copper has declined while tin has advanced sharply. Notwithstanding large supplies in this country and large shipments afloat, tin has risen because of speculation in the London market. A considerable quantity of prompt tin has changed hands, but at concessions. Futures are not being bought. There is fair domestic demand for lead, but foreign business is lacking. Concerted efforts have been made to drive lead prices down, but without apparent success. Export business is also lacking in zinc. Among old metals tin grades and lead have advanced. We quote in carload lots: Lake copper, 12.75c.; tin, 46.50c.; lead, 6.70c.; spelter, 5.85c.; antimony, 10c., in less than carload lots. On old metals we quote copper wire, crucible shapes and copper clips, 9.75c.; copper bottoms, 8.50c.; red brass, 7.75c.; yellow brass, 6.50c.; lead pipe, 5.75c.; zinc, 3.75c.; pewter, No. 1, 24c.; tin foil, 28c.; block tin, 34c; all buying prices for less than carload lots.

Canadian Scrap Market

TORONTO, ONT., July 14.—While there is some movement in iron and steel scrap, the demand is confined almost entirely to small tonnages for spot delivery. Steel plants are taking in shipments of heavy melting steel and turnings against old contracts, but new orders are coming forward very slowly and few consumers have placed contracts for third quarter. Foundry activities have not improved and as a result the majority of plants are operating only about 50 per cent capacity; hence their scrap requirements are at a minimum. Trading between dealers has also fallen off. The present holiday seasons is one of the chief reasons given by local dealers for the stagnant state of the market, and scrap interests point out that this year the dullness is even more pronounced than it was a year or two ago. Dealers' buying prices are as follows:

	Gross Tons	
	Toronto	Montreal
Steel turnings.....	\$9.00	\$8.00
Machine shop turnings.....	9.00	8.00
Wrought pipe.....	8.00	10.00
Rails.....	12.00	13.00
No. 1 wrought scrap.....	11.00	12.00
Heavy melting steel.....	11.00	10.50
Steel axles.....	14.00	18.00
Axles, wrought iron.....	18.00	20.00
Net Tons		
Standard car wheels.....	13.00	14.00
Malleable scrap.....	14.00	14.00
Stove plate.....	14.00	14.00
No. 1 machinery cast.....	17.00	19.00

Exportation of \$70,000,000 worth of electrical machinery and apparatus in the fiscal year 1924 against \$25,000,000 in 1914 and \$10,000,000 in 1904, illustrates the increase in world use of electrical apparatus of American makes. The number of countries, colonies, protectorates and mandated territories to which our electrical devices were sent in 1922, the latest year for which official details are available, was 109.

Progress is noted on the chemical plant being erected at Vanderbilt, just outside of the city limits, Birmingham, Ala., by the Redd Chemical & Nitrate Co., capitalization \$400,000. W. P. Redd, who is at the head of the new corporation, was for years manager of the Southern plant in this district for the Grasselli Chemical Co. The plant being erected now will cost around \$500,000, and will be modern in every particular.

PERSONAL

H. Foster Bain, director of the Bureau of Mines, Washington, is spending some weeks in England, studying the methods employed there for the prevention of accidents in coal mines.

Bertwell C. Root has been appointed sales manager of the Carthage Machine Co. of Canada, Belleville, Ont. Formerly he was connected with the Sherbrooke Machinery Co. and the Hydraulic Machinery Co.

R. J. Young, since 1922 assistant general manager in Canada for the United Hotels Corporation of America, has been appointed general sales manager of the Canadian Car & Foundry Co., Montreal, Que., succeeding D. R. Arnold, who has accepted a position with the Union Metal Products Co., Chicago.

Lieut.-Col. John Joseph Swan, adjutant general Officers' Reserve Corps, U. S. A., in civil life a principal in the Engineering Business Exchange, New York, has been ordered to active duty until July 28.

Gunnar Starck, Sweden, metallurgical engineer, who is in America for the purpose of study, for the past year or so with the Morgan Construction Co., Worcester, Mass., in its assembling department, is in Chicago. From Chicago he plans to visit Pittsburgh. He will spend about five years in this country for the purpose of qualifying for head of one of the largest Swedish steel mills.

William P. Witherow, president Witherow Steel Co., Pittsburgh, sailed July 10 for Europe. He will be gone about two months.

W. S. Greenawalt has been appointed open-hearth superintendent of the Otis Steel Co., Cleveland. He was formerly connected with the Pittsburgh Steel Co. and the Cromwell Steel Co. in a similar capacity.

C. A. Walker, comptroller National Screw & Mfg. Co., has been elected president of the Cleveland chapter of the Society of Industrial Engineers for the ensuing year. Other officers include George Smith, Adams Bag Co., vice-president; V. G. Kay, industrial engineer, treasurer, and J. F. Price, vice-president George T. Trundle, Jr., Engineering Co., secretary.

E. H. Van Wey, representative of the Ideal Concrete Machinery Co., Cincinnati, is now located in Toledo, Ohio, with offices at 602 Spitzer Building. Previously he made headquarters in Detroit.

William M. Ryan has been elected president of the Youngstown Steel Car Co., Niles, Ohio, succeeding William Wilkoff, resigned. Until recently Mr. Ryan was president of the Ryan Car Co., Chicago, which he helped organize in 1907. He has had wide and successful experience in railroad car construction work, having been identified with the Pullman Co. and the Pressed Steel Car Co.

H. L. Mode has joined the sales organization of the Florandin Equipment Co., 110 West Fortieth Street, New York. Mr. Mode formerly was connected with the New York office of the Chesapeake Iron Works.

R. E. Clingan, general manager Bock Bearing Co., Toledo, Ohio, sailed for Europe July 10 to negotiate with interests in Germany and France for the manufacturing rights of Bock taper roller bearings on the Continent. He will also spend some time with the company's subsidiary, the British Bock Bearings, Ltd., London and Glasgow.

L. W. Byrne, formerly general sales manager of the Wilmarth & Morman Co., Grand Rapids, Mich., has been appointed general manager of the Delahunty Dyeing Machine Co., Pittston, Pa.

James B. Baker was elected president and general manager of the Safety Emery Wheel Co., Springfield, Ohio, at the annual meeting held July 8. He succeeds the late A. G. Spencer. Other officers chosen are: Vice-president and secretary, Charles Gwyn; treasurer and purchasing agent, James I. Baker.

Floyd E. Sullivan, Wausau, Wis., has been appointed assistant trade commissioner to Johannesburg, South Africa. Perry J. Stevenson, Washington, recently in charge of the Philadelphia office, has been re-assigned as trade commissioner in charge of the Johannesburg branch.

J. Ward Penn, for several years in the bituminous coal department of the M. A. Hanna Co., has become associated with Barrows & Co., Inc., dealers in coal, coke and pig iron, Bankers' Trust Building, Philadelphia.

Dr. Francis M. Walters, Jr., for the past two years connected with the U. S. Bureau of Standards in Washington as associate physicist, has been appointed director of the special research bureau of metallurgy, which has just been established by the Carnegie Institute of Technology. Dr. Vsevolod N. Krivobok, metallurgist, has been appointed an assistant. The object of the new department is to apply to metallurgy recent discoveries in physics and chemistry. Work of the bureau will begin early in September.

Frank G. Drew, vice-president Winchester Repeating Arms Co. since 1916, has been chosen president, vice John E. Otterson, resigned, who has been president since 1919. R. Earle Anderson tendered his resignation as vice-president at the same time that Mr. Otterson retired. William T. Birney was elected vice-president to succeed Mr. Drew and William A. Tobler, vice-president to succeed Mr. Anderson. George A. Taylor will become general sales manager of the company and Edwin Pugaley will replace Whitford Drake as factory superintendent.

H. W. Maxwell has been made master mechanic of the Boston division, New York, New Haven & Hartford Railroad, to succeed James P. Egan, who has been made superintendent of car inspection with headquarters at New Haven, Conn. W. G. Squires has been made master mechanic at East Hartford, Conn., shops, to succeed L. G. Marete, resigned.

Thomas W. Bell, who has been in the pipe sales department of the Jones & Laughlin Steel Corporation, Pittsburgh, has been transferred to the Pacific Coast district sales office, San Francisco, and will look after the company's pipe business in the California oil fields, making headquarters in Los Angeles. Mr. Bell has been with the Jones & Laughlin Steel Corporation since 1917. Previously he was with the Page-Hersey Co., and before that with the National Tube Co., McKeesport, Pa.

W. J. Rainey, Inc., Resumes in Part

W. J. Rainey, Inc., which had trouble at its Allison and Royal plants when it announced a reduction in wages to the scales of other independent Connellsville coal and coke oven operators and immediately suspended operation of these plants, has been able to get them going in part. Most of this company's business lately has been in coal and the strike was largely among the miners, who evidently have found employment hard to secure elsewhere that would pay as well as the work offered by the Rainey company.

Youngstown copperoid steel sheets are being used for the ventilating line and Youngstown pipe for the water line of the Moffat tunnel in Colorado. The main tunnel is 16 x 24 ft. and is 6.9 miles long. The East portal has an altitude of 9198 ft. and the Western 9085 ft. Both of the steel products mentioned are manufactured by the Youngstown Sheet & Tube Co.

"The Home Builder's Encyclopedia" is the title of a booklet just issued by the Truscon Steel Co., Youngstown, containing a foreword by President Julius Kahn. It is available for general distribution. It illustrates the uses of steel products in ordinary house construction, in addition to containing valuable suggestions of a general nature regarding building.

OBITUARY

BENJAMIN G. LAMME, mathematician and electrician, of whose death brief mention was made in THE IRON AGE last week, had to his credit more than 150 inventions.



BENJAMIN G. LAMME

The single-phase, alternating current railroad system which revolutionized the industry in the early nineties, and now is in universal use on street car and long electric transit systems, was his conception. Other spectacular designing achievements include the generating equipment for the World's Fair in Chicago in 1893, the 5000-hp. generators which harnessed Niagara Falls, the generating and motor equipment for the first big railroad electrification on the New York, New Haven & Hartford Railroad and the design of what was perhaps the most successful synchro-

nous converter. Mr. Lamme was born on a farm near Springfield, Ohio, 60 years ago and was graduated from Ohio State University in mechanical engineering in 1888. He won the Edison Medal in 1919 for the invention and development of electrical machinery and during the World War he was a valuable member of the Naval Advisory Board.

ROBERT H. CARLISLE, vice-president Strong, Carlisle & Hammond Co., Cleveland, dealer in machinery and mill supplies, died July 5, aged 75 years. He had not been actively engaged in business for several years, owing to poor health. Mr. Carlisle was born near Bedford, Ohio, and joined the Union Army when 15 years old. In 1887 he became associated with the late E. E. Strong and L. J. Hammond in the organization of the Strong, Carlisle & Hammond Co. and was influential in the firm's business until recent years. His son, Tyler W. Carlisle, is secretary-treasurer of the company.

GEORGE S. GATES, for eight years with the Philadelphia office of Charles Dreifus & Co., Pittsburgh, scrap dealers, died on July 13, aged 46 years. In recent years he had been associated with Hiram Winternitz in the management of the Dreifus office in Philadelphia and was well known in the iron and steel scrap trade. Most of his career was bound in some way with the steel business. He was at one time connected with the George A. Just Co., structural steel fabricator, Long Island City, N. Y. Mr. Gates is survived by his wife and three sons, the eldest of whom, Walter Gates, is employed in the Dreifus office in Philadelphia.

GEORGE L. ALLEN, aged 72 years, a capitalist of St. Louis, died on July 6 at his summer home in Rye Beach, N. H., from paralysis after an illness of several months. He was born in St. Louis and was educated in the public schools. He was connected with the Fulton Iron Works, established by his father, Gerard B. Allen, and was president of the company until 1906.

PATRICK POWERS, superintendent of the metal mill, Rome Brass & Copper Co., Rome, N. Y., died at his home in that city on July 6 at the age of 79 years. He became identified with the company in 1879 as superintendent and later was appointed superintendent of the metal mill.

THOMAS M. O'SHEA, master mechanic for the Titusville Forge Co., Titusville, Pa., died at his home in that

city on July 10, following a heart attack. He was 59 years of age and had been connected with the company for 18 years.

WALTER KENNEDY, consulting engineer, died at the Allegheny General Hospital, Pittsburgh, on July 6, aged 64 years. He was a brother of Julian Kennedy, consulting engineer, Pittsburgh.

M. P. CROMLING, director of purchases Willys Overland Co., Toledo, Ohio, died suddenly, June 27.

HENRY THEOBALD, president Toledo Scale Co., died on July 12, at his home in Toledo, Ohio. He was born in Dayton, Ohio, in 1865, and after a course in a commercial college spent 17 years with the National Cash Register Co., becoming general manager and chairman of the executive committee. Later he bought a controlling interest in the Toledo Scale Co. and devoted himself thereafter to that business.

GEORGE EDWARDS JUDD, president-treasurer Mattatuck Mfg. Co., Waterbury, Conn., died on June 30.

WILLIAM J. LAUSTERER, president and general manager Automatic Registering Machine Co., Jamestown, N. Y., was thrown from his horse while riding near his summer home at Greenhurst on Lake Chautauqua, July 11, and received injuries which resulted in almost immediate death. He was born in Buffalo 56 years ago and for several years served as shop superintendent of the Buffalo, Rochester & Pittsburgh Railroad at Rochester. Later, he became master mechanic of the Yawman & Erbe Mfg. Co. there. With the organization of the United States Standard Voting Machine Co., Jamestown, N. Y., in 1900, he became superintendent, holding that position until 1915, when the concern was reorganized and he became president and general manager of the Automatic Registering Machine Co. He was also treasurer of the Jamestown Malleable Products Corporation.

Electrical Exports Are Heavy

Exports of electrical goods during May, 1924, totaled \$7,206,587 as compared with \$5,349,568, for the same month of 1923, this gain being broadly distributed over the whole range of electrical classes, according to preliminary figures released by the Department of Commerce.

Apparatus lines, especially transformers, showed a general gain over the same month of the year previous; in the case of the items named, the number of units did not increase greatly but the average capacity and value per transformer were considerably above those for 1923. The stationary motor class is practically the only apparatus class in which there was any marked decrease, the biggest drop being in motors under 1 hp. Railway motors showed a good increase, but electric locomotives decreased.

In general appliance lines, motor-driven household devices remained practically unchanged, but there was a consistent gain in the case of domestic heating and cooking devices, while fan shipments were more than double those during May, 1923.

Radio exports continued to increase and to that influence was possibly due some of the good increases shown in the shipments of batteries, both primary and secondary.

Wiring devices and miscellaneous supply lines all showed a fair increase, and insulated wire and cable exports were approximately 13 per cent above the figure for the same month of 1923.

On the whole, our foreign trade in electrical goods has continued the favorable trend which it has shown since the beginning of the year.

The trustee of the bankrupt Ogren Motor Car Co., Milwaukee, has been granted authority to dispose of the assets, consisting largely of pressed steel frames and other materials, to the Huffmann Truck Co., Elkhart, Ind., for \$3,000.

STEEL AND INDUSTRIAL STOCKS

The range of prices on active steel and industrial stocks from Monday of last week to Monday of this week was as follows:

	Low	High		Low	High
Allis-Chalmers ..	50 3/4	53 3/4	Inland Steel ...	34	35
Allis-Chal. pf. ...	95 1/2	95 3/4	Int. Har.	87 1/2	89
Am. B. S. & Fdy. 81 1/2	82	82	Jones & L'lin pf. 111 1/2	111 1/2	111 1/2
Am. B. S. & F. pf. 104 1/2	104 1/2	104 1/2	Lima Loco.	60 1/2	63 1/2
Am. Can.	113 1/2	117 1/2	Midvale Steel ..	25 1/2	25 1/2
Am. Can. pf.	114	115	Nat.-Acme	6 1/2	7
Am. Car & Fdy. ...	164 1/2	166 1/2	Nat. En. & Stm. 20 1/2	22 1/2	22 1/2
Am. C. & F. pf. 123 1/2	123 1/2	123 1/2	N. Y. Air Brake 42 1/2	44 1/2	44 1/2
Am. Locomotive. 74 1/2	80 1/2	80 1/2	Nova Scotia Stl. 50 1/2	50 1/2	50 1/2
Am. Loco. pf.	119 1/2	119 1/2	Otis Steel	8	8 1/2
Am. Radiator. ...	105 1/2	107 1/2	Otis Steel pf. ...	50	51
Am. Steel Fdries. 35 1/2	37 1/2	37 1/2	Pressed Steel Car 49	51	51
Am. Stl. Fd. pf. 103	103 1/2	103 1/2	Pressed Steel pf. 83	83	83
Bald. Loco.	114 1/2	117 1/2	Repiogle Steel ..	10 1/2	12
Bald. Loco. pf. 116	116	116	Republic	46 1/2	48 1/2
Beth. Steel.	46	47	Republic pf.	86	86
Beth. Stl. 7% pf. 90 1/2	91	91	Sloss-Sheffield ..	59 1/2	60 1/2
Br. Em. Steel. ...	2 1/2	3 1/4	Sloss-Sheffield pf. 83	83	83
Br. Em. Stl. 2 pf. 8 1/2	8 1/2	8 1/2	Steel of Canada. 71 1/2	73	73
Chic. Pneu. Tool 86	86	86	Un. Alloy Steel. 22 1/2	22 1/2	22 1/2
Colo. Fuel.	46	49	U. S. Pipe.	94 1/2	98 1/2
Crucible Steel ..	54 1/2	55 1/2	U. S. Pipe pf.	93	93 1/2
Crucible Stl. pf. 83	83	83	U. S. Steel.	99 1/2	101 1/2
Deere pf.	63	63	U. S. Steel pf. ...	122	122 1/2
Gen. Electric. ...	235 1/2	245 1/2	Vanadium Steel. 21 1/2	22 1/2	22 1/2
Gt. No. Ore Cert. 27 1/2	27 1/2	27 1/2	W'house Air Br. 93	95 1/2	95 1/2
Gulf States Steel 70	71 1/2	71 1/2			

Industrial Finance

Receiver Frank A. Scott for the Standard Parts Co., filing the fourth report covering operations from the beginning of the receivership, Sept. 1, 1920, to June 18, 1924, showed reduction in assets as between the former date (\$29,086,107) and the latter date (\$5,352,242) amounted to \$23,733,865, as follows:

Reduction in liabilities by cash payments and adjustments	\$7,933,722
Shrinkage in assets by adjustments, depreciation, etc.	14,456,810
Reduction in good will by reason of cancellation of capital stock.	1,343,333

The 5 per cent dividend paid June 10, last, brings total cash paid to creditors to date up to \$7,320,523, or 75 per cent of all claims filed and allowed.

After giving effect to the new financing and readjustment of capital stock of the General Leather Co., the Reynolds Spring Co. reported surplus of \$2,292,710, as of March 31, 1924. Grouped under assets is \$649,430 in cash, \$774,695 in notes and accounts receivable, and \$1,283,332 in inventories.

Industrial Notes

Foundry property of the Gillespie Eden Corporation, Paterson, N. J., has been sold by the Harrison S. Colburn Co. Most of the land included was sold to the Gillespie interests in 1919 by James T. Jordan to permit the expansion of a plant to make washing machines. The foundry was operated continuously until about a year ago, when the Gillespie Eden Corporation was sold. Later the entire plant was on the market. The purchasers are thought to be prominent foundry men.

Affairs of the Aetna Nut Co., Southington, Conn., will soon be settled, it now appears. The company has adjusted its Government claims of approximately \$75,000, and a claim against the State of Connecticut presumably will be adjusted soon. An option by Seth L. Martin, Brookline, Mass., for the purchase of the property amounting to \$28,000, has been taken up. Indications are that there will remain about \$100,000 to divide among stockholders.

The Collins Co., Collinsville, Conn., maker of agricultural implements and tools, is to double its share capitalization and distribute the new stock pro rata to shareholders of record July 8. At the meeting at which the new shares were authorized, stockholders elected two vice-presidents, E. A. Newton, superintendent, and Charles Hopkins Clark. Otherwise the personnel and board of directors remain as before.

The Thomas Plow Co., Bath, Me., organized three years ago, has started to manufacture snow plows, from 1 to 10 tons capacity, at the plant of the Bath Iron Works. The plows are made of iron and steel and may be used with any caterpillar tractor. Horace Thomas is treasurer.

By arrangement with the Ferry Cap & Set Screw Co., Cleveland, the Eaton Axle & Spring Service Co., that city, has taken over the distribution throughout the country of a shackle bolt nut, a new device made by the Ferry company to eliminate rattles coming from the spring shackle of automobiles.

The Torrington Co., Torrington, Conn., maker of needles,

will discontinue its Chicopee, Mass., plant. However, it will be operated about two months during the process of moving mechanical equipment. The replacement value of the plant is estimated at \$300,000. Approximately 200 were employed at the plant.

Orders received by the General Electric Co. for the six months ending June 30 totaled \$144,707,887, a decrease of 12 per cent compared with the corresponding period in 1923, when the total was \$164,263,755. Orders for April, May and June, 1924, reached \$71,219,984, a drop of 15 per cent compared with the same months of 1923.

The Skinner Chuck Co., New Britain, Conn., will close its factory for the annual vacation from July 14 to 23. Office and shipping departments will remain open to answer inquiries and to ship orders for stock goods.

Executive offices of the Cleveland Stone Co. will be located on the thirteenth floor of the new Union Trust Building, Cleveland, after Aug. 1.

Three separate departments have been created at the Hawthorne works of the Western Electric Co., Chicago, by a recent reorganization. Separate accounts shall be maintained for each department. Designations given are the merchandizing department, manufacturing department and equipment department. Invoices and statements should be addressed to the department concerned.

The Electric Refrigerating & Appliance Co., Dallas, Tex., has been organized to manufacture refrigerating equipment. Only part of the manufacturing will be done by the company, which will supervise all installations. R. G. Moore is manager.

The S. O. S. Radio Corporation, care of Edwin I. Alsberg, Paterson, N. J., has been organized with \$100,000 capital stock as distributor of radio equipment. Mr. Alsberg is president.

The L. H. Butcher Co., 2030 Bay Street, Los Angeles, Cal., was recently organized with capital stock of \$250,000, as successor to a partnership in the manufacture of metals and metal products.

The Chadwick-LeClair Co., 5143 Trumbull Avenue, Detroit, has been organized with \$25,000 capital stock, to manufacture tools, dies and a special die-casting machine for babbiting bearings. The company has taken over the business of a former partnership. E. J. Knopf is one of the principals.

The Andrews Adding Machine Corporation, 312 Burnet Avenue, Syracuse, N. Y., organized with \$100,000 capital stock, will manufacture portable automatic adding machines. It is operating a small plant and installing equipment. N. A. Andrews is president.

Carbon high-speed and alloy tool steels, hot work steels, alloy die steel, miners' drill steels and magnet steels are among the steels featured in the new 64-page catalog of the Jessop Steel Co., Washington, Pa. Sheet, strip and plate products are also shown, as well as saw steels and stainless and rustless metals. Steels for automobile and aeroplane construction, agricultural steels and steels to meet SAE specifications are also offered. Several pages are devoted to the effects of heat-treatment on the state of steel and the principles underlying successful hardening practice. Hardness conversion tables, wire gages, tables and other useful information is given. The catalog is of pocket size and is indexed for ready reference.

A second edition of its press users reference book has been published by the Toledo Machine & Tool Co., Toledo, Ohio. The book has 240 pages, size 3 1/2 x 6 1/2, and has a flexible leather cover. Specifications are given and features of a large number of presses are briefly described, data on drop hammers, trimming presses, gap trimming and squaring shears and other machines being also given. The 72 pages devoted to engineering data cover a wide range of useful information, forming a valuable part of the publication. Lists of press and drop hammer parts extend over several pages.

The first two of a series of production layouts showing how special equipment can be applied to its standard milling machines, so as to increase the production of those machines, have been issued by the Kearney & Trecker Corporation, Milwaukee. A large photographic reproduction of the special equipment is shown on one side of the sheet, which is 8 1/2 x 11 in., details of the layout being given on the reverse side. The specific advantages of the layout illustrated are tabulated for easy reading. A folder for filing the layouts accompanies the first of the series.

Machinery Markets and News of the Works

VERY LITTLE BUYING

Demand Confined to Single Tools—Slight Improvement in Inquiry

Purchases by Norfolk & Western—Large Amount of Used Equipment to Be Placed on Market

The dullness of recent weeks continues, and the comparatively few orders placed have been for the most part for individual machines. A pick up in inquiry toward the close of the week has been noted, however, in some centers.

Purchases have been made by the Norfolk & Western Railroad on its recent list and more are expected during the coming week.

Action on the large list of the Santa Fe has been further delayed and it appears doubtful whether orders will be placed in the near future except for a relatively small proportion of the items. The Virginian Railway has been in the market during the week.

In machines for export, orders from Cuba featured the market. The Mexican National Railways are reported to have placed orders with a large dealer on extended credit terms, the original list of tools, how-

ever, having been reduced considerably. Inquiries from European sources for equipment for military arsenals are said to have been received by two or three tool builders.

The Chicago Board of Education at its meeting on July 9 failed to approve recommendations for equipment purchases, but referred the matter to its committee on building and grounds which meets during the current week.

It is reported that the Westinghouse Electric & Mfg. Co., East Pittsburgh, has dropped from its quarterly list most of the larger tools.

The Cleveland Water Works Department has placed most of the items included in its recent list. An order for several lathes, placed in the Cincinnati district, is one of the few reported purchases by the automotive industry. Several tools have been purchased by the Brooklyn Edison Co. for a repair shop at Brooklyn, N. Y.

Business in used tools has been fair. An important transaction was the taking over of the entire equipment of the Power & Mining Machinery Works at Cudahy, Wis., by the McCabe & Sheeran Machinery Corporation, New York. The equipment, which includes machine tools, cranes, pattern shop and foundry equipment, is valued at more than \$500,000.

New York

NEW YORK, July 15.

EXCEPT for a few purchases of large tools by railroads there has been no important buying of machine tools the past week. The Norfolk & Western bought a 90-in. driving wheel lathe, but no word has reached here whether it closed for all of the tools on its recent large list. The Virginian Railway bought a 48-in. car-wheel borer. The American Steel & Wire Co. bought a 5-ft. radial drill. Orders have recently been placed by the Brooklyn Edison Co. on a list of long standing. The several tools bought were for a repair shop in Brooklyn. It is reported that lists of equipment for foreign military arsenals are being quietly figured by two or three companies. The inquiries are said to come from two of the smaller countries of Europe, but nothing definite is known as the inquiries here have been kept pretty well under cover.

One of the most important transactions in years in used machine tools of large types is the taking over by the McCabe & Sheeran Machinery Corporation, 50 Church Street, New York, of the entire equipment of the Power & Mining Machinery Works at Cudahy, Wis. This equipment, valued at \$500,000 or more, will be offered for sale by the McCabe & Sheeran Machinery Corporation, and a complete list of the machines will be published shortly. The equipment includes boring mills, planers, radial drills, about 50 cranes and the full contents of the pattern shop and foundry as well as of the machine shop. The McCabe & Sheeran Machinery Corporation has opened an office at the plant at Cudahy, Wis., which is in charge of H. P. McCabe.

Bids will be received by the Bureau of Supplies and Accounts, Navy Department, Washington, until July 22 for a quantity of pneumatic boiler tube cleaners, with spare parts and accessories for the South Brooklyn and Puget Sound Navy Yards, schedule 2406.

The Public Works Supplies and Tenders Committee, Wel-

lington, New Zealand, will receive bids until Aug. 14, for one electric-operated multi-stage turbine pump, complete with accessories, for the Karori Water Supply Works.

James F. Carey, 120 Liberty Street, New York, is in the market for a 150-hp. boiler, self-contained type, to operate at 150 lb. working pressure, also for one dragline bucket, 2 to 2½-yd. capacity.

Benjamin Newman, 65 Fifth Avenue, New York, manufacturer of sanitary ware, etc., is having plans completed for a four-story factory, 100 x 100 ft., at Long Island City, to cost approximately \$120,000 with equipment.

United States Consul Leon Dominian, Rome, Italy, has information regarding six hydroelectric generating plants to be erected in the vicinity of Sardinia. One plant has now been completed and work has been started on a second station, for which equipment will soon be purchased.

Fire, July 8, destroyed a portion of the plant of the Metropolitan Material Co., Glendale, L. I., manufacturer of sash, doors, etc., with loss estimated at \$100,000 including equipment. It is planned to rebuild.

The Advance Garage Co., 26 Court Street, Brooklyn, has plans for a two-story service, garage and repair building, 100 x 147 ft., at 405-15 Montgomery Street, estimated to cost \$90,000. Magnuson & Kleinert, 52 Vanderbilt Avenue, New York, are architects.

The naval appropriation act provides for the expenditure of \$71,000 at the New York Navy Yard, of which about \$40,000 will be used for extensions and improvements in the power plant; \$17,500 will be utilized for extensions and betterments in the steam-heating distributing system. The work will be carried out under the direction of the Bureau of Yards and Docks, Navy Department, Washington.

The Board of Education, New Rochelle, N. Y., plans the installation of manual training equipment at its proposed two-story high school, estimated to cost \$800,000. Plans are being drawn by Starrett & Van Vleck, 8 West Fortieth Street, New York, architects.

Victor Mayfer, 15 East Fortieth Street, New York, architect, has completed plans for a two-story automobile service, repair and garage building, 120 x 160 ft., estimated to cost \$70,000.

The Savage Arms Corporation, Utica, N. Y., is arranging for expansion in its electric device manufacturing divi-

The Crane Market

Activity in purchases of both locomotive and overhead traveling cranes seems to have been finally affected by the summer dullness, so that there has been little of interest in the past week. A fair volume of business is still pending, but few new inquiries have been issued. The Southern Railway, Washington, D. C., which has been receiving bids direct on a 10-ton overhead crane for its Spencer, N. C., shops, will probably purchase all other cranes involved in contracts instead of through the engineers executing the work. The Long Island Railroad is said to have decided upon award of the six 20-ton hand power cranes recently asked for, but the builder is as yet unnamed. Business in locomotive cranes is exceedingly light. The New York & Queens County Railway Co. recently closed on a 15-ton, slightly special electric locomotive crane. The Miami Electric Light & Power Co., Miami, Fla., has purchased a 75-ton, 55-ft. span, power house crane from an Eastern crane builder.

Decline in the crane business in the Pittsburgh district since the first of the month is best described as a slump. Few sales are noted and with inquiries scarce and recent

sales reduced to pending orders, the immediate prospect is rather poor. Julian Kennedy, engineer in charge of improvements at the blast furnace plant of Pickands, Mather & Co., Toledo, Ohio, is understood to have placed orders for two 35-ton cranes and a 5-ton 100-ft. span crane has been bought for the Pittsburgh Steel Co., Monessen, Pa., and a 5-ton crane for the Superior Steel Products Co., Monaca, Pa. The group of cranes and hoists for the Westinghouse Air Brake Co., Wilmerding, Pa., is still pending.

Among recent purchases are:

Southwestern Portland Cement Co., Dayton, Ohio, two 5-ton electric traveling cranes and four 10-ton hand power cranes, from the Northern Engineering Works.

Westinghouse Electric & Mfg. Co., a 10-ton, 4-motor, 48-ft. span electric traveling crane for its Trafford, Pa., plant, from the Morgan Engineering Co.

Edward G. Budd Mfg. Co., Philadelphia, two 5-ton, 3-motor overhead cranes from an unnamed builder.

sion for the production of electric-operated refrigerators for commercial and domestic use.

The Board of Directors, Brooklyn Hospital, 26 Broadway, New York, has had plans drawn by Lord & Hewlett, 2 West Forty-fifth Street, architects, for a two-story addition to the power plant to cost approximately \$30,000.

The Central Railroad of New Jersey, Terminal Building, Jersey City, N. J., has awarded a general contract to the Tilt-Hargan Co., 90 West Broadway, New York, for two-story buildings at its repair shops at Elizabeth, N. J., 38 x 150 ft., and 100 x 300 ft., estimated to cost \$100,000.

Charles Mundt & Sons, 59 Fairmount Avenue, Jersey City, N. J., manufacturers of perforated metals, screens, etc., have filed plans for a one-story addition to cost \$10,000. C. H. Ziegler, Jersey City, is architect.

The New York Steam Corporation, 280 Madison Avenue, New York, operating local steam-generating plants for power and heating, has arranged a preferred stock issue of \$1,034,000, a portion of the proceeds to be used for extensions and improvements. James D. Hurd is president.

The Gilbey Wire Co., Newark, N. J., is in the market for wire drawing machinery, 20 to 22 in., 8 x 16-in. blocks.

The Trowbridge Conveyor Co., care of William H. Trowbridge, 382 Bloomfield Avenue, Passaic, N. J., newly formed with capital of \$25,000, to manufacture conveying systems, screens, chutes, idlers, etc., has a plant and fully equipped machine shop and is in the market for material.

New England

Boston, July 14.

THE little improvement noticeable in the machine tool business a week ago appears to have been largely dissipated, sales and inquiries having fallen to a minimum. The first half of July finds, in the aggregate, fewer orders on the books of machine tool dealers than for the corresponding period last month. Industrial activity in New England, generally, is showing signs of recovery, particularly in the cotton and woolen fabric industries. The metal working industries are falling behind, however. With a sizable recovery in the textile industries will probably come a gradual and steady betterment, as it is one of the best sources of demand for the machine tool trade. Repair shop equipment in the textile industry has been allowed to drift to a low point.

Of the few inquiries received the past week perhaps those from California are most interesting because Boston dealers are now in position to do business with machine tool users on the Pacific Coast, as a result of the various carriers that have sprung up fairly recently. It is now possible for Boston dealers to sell tools on the Coast at a smaller cost to the consumer than at Middle Western points, due to the low freight rate. If negotiations go through, Boston used tool dealers will shortly sell a considerable amount of equipment in California. New inquiries include miscellaneous equipment required by the General Electric Co., West Lynn, Mass. The company has no list out, however, its requirements being more or less

special. Two or three New Hampshire and Vermont interests, contemplating the starting of small shops, are inquiring for used equipment, the aggregate of which is inconsequential.

New bids will be asked for the proposed two-story, 80 x 106 ft. trade school contemplated by Middletown, Conn. R. W. Sellow, Box 467, Middletown, is the architect.

Bids have closed on a one-story plant for the Wood Hydraulic Hoist & Body Co., 3371 Washington Street, Jamaica Plain, to be erected at Brighton, Boston. The Warren Engineering Co., Terminal Wharf, Charlestown, Boston, is the architect.

Tenders have been asked by the Underhay Oil Co., 73 Battery March Street, Boston, on equipment for its new plant to be erected at 66 Rowland Street, Charlestown, Mass. Plans are private.

The Westinghouse Electric & Mfg. Co., Page Boulevard, Springfield, Mass., has awarded contract for a 80 x 91 ft. heating plant. McClintock & Craig, Springfield, are the architects.

Thomas P. Glynn, chairman of the School House Commission, Boston, has awarded contract for additions to the manual training shops and other work at the George T. Angell School, Roxbury. Elwell & Blackwell, 44 Broomfield Street, Boston, are the architects.

The Forbes Lithograph Mfg. Co., Chelsea, Mass., has awarded a general contract to the Aberthaw Co., Boston, for a new power house and miscellaneous construction to cost \$50,000. Monks & Johnson are the architects.

The Smith & Winchester Mfg. Co., South Windham, Conn., has awarded contract to the Aberthaw Co., Boston, for a foundry extension to cost \$60,000. W. Abbe, Jr., is president. Plans are private.

The Mohawk Mfg. Co., College and Hanlin Streets, Middletown, Conn., manufacturer of piano hardware, etc., has awarded a general contract to Denis O'Brien & Sons, Inc., Middletown, for a two-story and basement addition, 36 x 68 ft., estimated to cost \$24,000. William H. Hunt, Torrington, Conn., is architect.

The International Harvester Co., 608 South Michigan Avenue, Chicago, has filed plans for a one-story service and repair works for its motor truck division at 63-71 North Beacon Street, Boston, estimated to cost \$55,000.

The Department of Streets and Engineering, Administration Building, 33 Lyman Street, Springfield, Mass., has awarded a general contract to B. W. Mellon, 293 Bridge Street, for a one-story municipal steam power house. McClintock & Craig, Springfield, are architects.

Stevens-Mader, Inc., Lynn, Mass., has work in progress on a three-story and basement automobile service, repair and garage building, 50 x 184 ft., estimated to cost \$150,000. George A. Cornet, 10 Central Avenue, Lynn, is architect.

B. N. Perkins & Sons, Inc., 2 Crescent Street, Holyoke, Mass., has plans for a one-story machine shop, 160 x 181 ft., for which a general contract will soon be let. A portion of the structure will be used for other service. Lockwood, Greene & Co., 24 Federal Street, Boston, are architects and engineers.

The Blackstone Valley Gas & Electric Co., Pawtucket, R. I., is arranging a fund of about \$500,000 for extensions in its power plant and system during the next 12 months. Work is now in progress on an addition to the steam-operated generating plant.

Philadelphia

PHILADELPHIA, July 14.

CONTRACT has been let by the Hess Bright Mfg. Co., Front and Erie Streets, Philadelphia, manufacturer of ball bearings, etc., to John Homan, Eighteenth and Cherry Streets, for a one-story addition, 35 x 142 ft., estimated to cost \$50,000.

The Philadelphia Electric Co., Tenth and Chestnut Streets, Philadelphia, has acquired about four acres at Lewis Street and Delaware Avenue for \$40,000 and contemplates using the site for a new power plant later.

The Price Gas & Electric Fixture Co., Philadelphia, has leased two floors in the building at 903-7 Market Street for a manufacturing plant.

Fred N. Greisler, 1035 Walnut Street, Philadelphia, architect, has plans for a two-story automobile service, repair and garage building, estimated to cost \$75,000 with equipment.

The Foreign Trade Bureau, Philadelphia Commercial Museum, has received an inquiry (42466) from the Yamato Trading Co., Ltd., 1 Irifunecho Rokuchrome, Kyobashi, Tokio, Japan, desirous of getting in touch with American manufacturers of tin or galvanized steel construction materials; also an inquiry (42470) from H. W. Rojer, Jr., Curacao, Dutch West Indies, interested in securing the addresses of American manufacturers of self-oiling or automatic-oiling windmills; an inquiry (42450) from Ramiro Fernandez Gomez, Casilla de Correo 230, Guatemala, Guatemala, desirous of getting in touch with American manufacturers of wire fencing and netting, steel furniture, metal furniture, steam boilers, agricultural machinery and tools, belting, steam engines, carpenters' and cabinet-makers' tools, iron and steel sheets, tin plate, and other products, and an inquiry (42441) from H. Caldera, Managua, Nicaragua, interested in getting in touch with American manufacturers of agricultural implements and machinery, tanks for preserving grains, etc.

In connection with its new repair and inspection shops at Twentieth and Johnson Streets, the Philadelphia Rapid Transit Co., Eighth and Dauphin Streets, Philadelphia, will erect a one-story trackless trolley building, 80 x 165 ft., and one-story main mechanical and inspection shop, 110 x 352 ft. The entire project will include seven structures.

The Philadelphia Boat Co., Philadelphia, care of Andrew C. Borzner, 717 Walnut Street, architect, is having plans drawn for a two-story boat-building and repair works, 40 x 100 ft., at 4412 Ridge Avenue, for which bids will soon be called on a general contract.

The National Alroil Burner Co., Ninth and Thompson Streets, Philadelphia, manufacturer of oil burning apparatus, is planning for enlargements and the installation of additional equipment. The company recently increased its capital from \$75,000 to \$1,000,000. John F. Straitz is president, and David W. Crossett, secretary.

The Foreign Trade Bureau, Chamber of Commerce, Philadelphia, has received an inquiry from a company in England desiring to get in touch with American manufacturers of handles for shovels, both eye and crutch shape.

The City Council, Philadelphia, has authorized an appropriation of \$2,000,000 for extensions and improvements in the municipal water system, including the installation of additional power and pumping equipment, particularly at the Belmont, Shawmont, Roxborough and Queen Lane pumping plants and Torresdale station. The Department of Public Works is in charge.

J. H. France, Philadelphia, until recently general manager of plants for the General Refractories Co., 117 South Sixteenth Street, has acquired the plant of the Snow Shoe Fire Brick Co., Clarence, near Philipsburg. The new owner will remodel for the manufacture of fire brick and other refractories.

The Luzerne County Gas & Electric Corporation, Wilkes-Barre, Pa., will build a steam electric power station on the Susquehanna River near West Nanticoke. Stone & Webster, Inc., Boston, Mass., has been retained to design and construct this plant, which will have an initial development of one 20,000 kw. turbo-generator and four 1726 hp. boilers.

Manual training equipment will be installed in the two-story and basement high school to be erected at Alverton, Pa., estimated to cost \$160,000, for which foundations will be laid at once. Howard C. Frank, Second National Bank Building, Connellsville, Pa., is architect.

The G. Woolford Wood Tank Mfg. Co., Lincoln Building, Philadelphia, has awarded a general contract to Barclay White & Co., 1713 Sansom Street, for a two-story power house at its plant at Colwyn, Pa., 50 x 50 ft.

The Erie Railroad Co., 50 Church Street, New York, will

make extensions in its car and locomotive repair shops at Avoca, Pa., to include the installation of additional equipment.

A portable cylinder reboring and valve seating machine and a 150-hp., 440-volt electric motor is wanted by the Reading Engineering Works, 116 Washington Street, Reading, Pa.

Frank Toomey, Inc., 129 North Third Street, Philadelphia, is in the market for 12 Cincinnati No. 1 plain millers or equivalent, cone type; five No. OG and two No. 00 Brown & Sharpe automatics; one No. 13 Brown & Sharpe spur and bevel gear cutter; two 11-in. Gleason bevel and two spiral gear generators; six No. 6 Fellows gear shapers and one 2 1/4-in. four-spindle Gridley.

Pittsburgh

PITTSBURGH, July 14.

MACHINE tool business, already quiet, has grown very dull the past week and with the decline in business has come the opinion that neither this month nor next will be productive of many orders. Action against the several lists which have been before the trade for some time still is deferred and it is reported that the Westinghouse Electric & Mfg. Co. has dropped from its quarterly list most of the larger tools, which would have run into a fairly big sum. Lack of money is not the cause of the quietness, but rather a disinclination to spend it just now.

Inquiry was so heavy at the beginning of 1924 that there were strong expectations of a good year. The checkup of sales, however, has disclosed that orders have not averaged more than half those of the same period of 1923 and it is figured that the remainder of the year must be marked by unusual activity to bring the year's results up to those of 1923.

The Weirton Steel Co., Weirton, W. Va., in connection with some changes in its sheet mill plant, has placed two 1500 kw. motors and a 1400 kw. rotary converter with the Allis-Chalmers Mfg. Co.

Manual training and vocational departments will be installed in the addition to the Mill Creek Township, Erie County, Pa., school, now under construction and estimated to cost \$85,000. Kirby & Johnson, Aerial Building, are architects and the Kirschner Brothers Construction Co., Erie, have the general contract.

The Federated Metals Corporation, Pittsburgh, has taken title to property at Winebiddle Avenue and Gross Street heretofore held by the American Reduction Co., for \$140,000, and contemplates using the site for a new plant.

The Western Maryland Railroad Co., Baltimore, is said to be considering plans for a new locomotive repair shop and engine house at Dunbar, Pa., estimated to cost \$30,000. It will replace a portion of the works recently destroyed by fire. H. R. Pratt, Hillen Station, Baltimore, is company engineer.

The Tompkins Fuel Co., Charleston National Bank Building, Charleston, W. Va., will take bids at once for equipment for its plant at Cedar Grove, W. Va., to include an electric locomotive, motor-generator set, cutting machinery, etc. Harold P. Tompkins is president; R. B. Bradley is construction engineer.

The Pittsburgh Piping & Equipment Co., Thirty-fifth and Charlotte Streets, Pittsburgh, has purchased the local plant of the Worthington Pump & Machinery Corporation on Forty-third Street. The new owner will occupy the works at an early date and plans the installation of additional equipment. This is the third branch plant to be sold by the Worthington company, in line with the decision to concentrate production at its larger works.

The Penn Public Service Corporation, Johnstown, Pa., has engaged Dwight P. Robinson & Co., Inc., 125 East Forty-sixth Street, New York, engineer and contractor, to design and erect an addition to its steam-operated electric generating plant at Seward, Pa., to double the present capacity. Boilers provided with preheaters and fans, stokers, boiler-feed pumps and accessory equipment will be installed.

The Williams Gauge Co., 543 Fourth Avenue, Pittsburgh, has had plans drawn by the Austin Co. for a one-story machine shop, 60 x 120 ft., on site lately purchased at Pennsylvania Avenue and Metropolitan Street, Northside. R. M. Williams is head.

The Board of Education, Fairmont, W. Va., plans the installation of manual training equipment in the new unit to

be erected at the East Side high school, estimated to cost \$175,000, for which foundations will be laid at once.

Gelsier Brothers, McKees Rocks, Pa., have awarded a general contract to the W. Deer Co., 1176 Dohrman Street, for the erection of a one-story automobile service, repair and garage building, 100 x 120 ft., on Broadway, estimated to cost \$40,000 with equipment. Frank Primer, 419 Chartiers Avenue, is architect.

The Weinhouse Automatic Steam Vaporizer, 217 Highland Building, Pittsburgh, recently organized with \$100,000 capital stock, is manufacturing an automatic steam vaporizer for the automotive trade. The company desires to hear from manufacturers equipped for this line and will receive bids for lots of 500 and 1000. Theodore H. Weinhouse is president and controlling holder.

The Rosedale Foundry & Machine Co., Pittsburgh, is inquiring for a 6-ft. heavy duty plain radial drill, a key-seater with 16-in. stroke and capacity for 2-in. width, also a power hammer for 2½-in. square stock.

Cincinnati

CINCINNATI, July 14.

THE machine tool industry generally is dull, but some manufacturers reported an increase in inquiries toward the end of the week. The principal buying was done by the Norfolk & Western Railroad, which closed for part of the equipment on its recent list. The Mexican National Railways are said to have placed a number of tools with a large dealer in this country at extended credit terms. The original list was considerably reduced. Orders from Cuba featured the market, one manufacturer booking three machines. There is little buying from the automotive industry, although a local manufacturer received an order for several lathes. Demand for motors is fairly active, one inquiry from Louisville including about 60. Used machinery sales continue fair, small tools in particular being in demand.

The Hooven, Owen, Rentschler Co., Hamilton, Ohio, has formed an alliance with the Maschinenfabrik-Augsburg-Nurnberg Construction Co., Bavaria, for the construction and development of the Diesel engine recently perfected by that company. The engines will be manufactured at the Hamilton plant of the company.

The Wellston Clay Products Co., Wellston, Ohio, has been organized with a capitalization of \$150,000 to manufacture brick. It has purchased the properties of the Rich Run Coal Co., near Wellston, and a 12-kiln plant will be erected. Homer A. Goddard is president.

The Springfield Washed Gravel Co., Springfield, Ohio, has been incorporated with capitalization of \$40,000 and will equip a gravel washing plant on Buck Creek, near Springfield. George L. Ohmart is president.

The Mills & Lupton Co., Chattanooga, Tenn., is in the market for two 330-hp. Heine boilers and one 350-hp. Sterling boiler, also a 400-kw. belt driven a.c. generator with auxiliary equipment.

The American Seeding Machine Co., Springfield, Ohio, has work under way on rearranging its core-room which is being done by its own organization. No machinery of any consequence will be required.

The Air Reduction Sales Co., 342 Madison Avenue, New York, has broken ground for the first unit of its new plant at Lima, Ohio, 185 x 250 ft., to cost \$50,000. Other units will be constructed later to cost about \$250,000 including equipment.

The Marion Coal Co., Chattanooga, Tenn., has plans for the installation of electric power and mining machinery on property near Whiteside, Tenn. H. L. Cory is president.

The Mills Equipment Corporation, Chattanooga, Tenn., machinery dealer, has inquiries out for one steam shovel, railroad type, about 1½-yd. capacity; also for one steam shovel, crawler type, about ¾-yd. capacity.

The Southern Cities Power Co., Chattanooga, Tenn., will proceed with the construction of its proposed hydroelectric generating plant on the Duck River, near Columbia, Tenn., and has awarded a general contract to the Foster-Creighton Co., Fourth and First National Bank Building, for preliminary dam construction. The project will involve close to \$200,000.

The Ross-Meehan Foundry Co., Chattanooga, Tenn., has awarded a general contract to the Converse Bridge Co., Anderson Street, for its proposed addition estimated to cost \$50,000. Equipment is now being purchased.

The Lima Gas Light Co., Lima, Ohio, will expend about \$150,000 for gas-generating, boiler and steam power equipment for its new artificial gas works. A general contract for the building has been let to the Lima Construction Co.

Chicago

CHICAGO, July 14.

THE market has lapsed into a state of extreme quiet. Orders are confined to individual machines with very few exceptions. Perhaps the largest transaction was the purchase of additional tools by a railroad equipment manufacturer as follows: One 36-in. x 24-ft., one 18-in. x 12-ft., and one 24-in. x 12-ft. engine lathe, and one pipe cutting machine. Contrary to expectations, the Chicago Board of Education failed to approve the recommendations for equipment purchases at its meeting on July 9, but referred the matter for further consideration to its committee on buildings and grounds which meets during the current week. It is believed, however, that at least a substantial proportion of the school list will be finally purchased. Action on the large Santa Fe list has suffered further delay and it is now doubtful whether orders will be placed in the near future except for a relatively small proportion of the items.

The C. G. Spring & Bumper Co., 1455 West Thirty-eighth Street, Chicago, has awarded contract for a two-story factory, 50 x 54 ft., and 70 x 220 ft., to cost \$28,000.

The Western Shade Cloth Co., Twenty-second and Jefferson Streets, Chicago, has awarded a contract for a one-story power plant, 90 x 95 ft., at 2052-2064 Spring Street, to cost \$10,500.

The Superheater Co., East Chicago, Ind., is building a second plant unit, which will double its capacity, and is also considering the erection of a new power house.

The Standard Oil Co. will erect a machine shop to cost \$50,000 across the street from its plant in Peoria, Ill.

The Eagle Wabash Co., 426 South Wabash Avenue, Chicago, manufacturer of lamp shades, has purchased the building formerly occupied by Crerar Adams & Co., Erie Street and Fairbanks Court. It has planned to build an addition and to equip the plant for display rooms and manufacturing purposes. The company's three plants will be consolidated in this one structure.

Thompson & Starr, Waseca, Minn., operating a local boat-building and repair plant, have plans for a one-story addition, with reported cost of \$25,000. Woodworking and other machinery to be required. It is proposed to commence work early in the fall.

William Seymour, 5117 Kenwood Avenue, Chicago, has inquiries out for two boilers, each about 250 hp. capacity, with accessory apparatus.

The A. F. Anderson Iron Works, 5844 Loomis Street, Chicago, has asked bids on a general contract for a one-story steel fabricating shop, estimated to cost \$75,000, for which plans have been drawn by R. C. Harris, 190 North State Street, architect.

Van Gunten & Van Gunten, 26 East Huron Street, Chicago, architects, have plans for the construction of a one-story and basement automobile service, repair and garage building at 135-41 Madison Street, Oak Park, Ill., estimated to cost \$50,000.

Bids will be received by the Town Council, Schleswig, Iowa, until July 21, for pumping machinery and auxiliary equipment, in connection with extensions and improvements in the municipal waterworks. Higgins & Son, Securities Building, Des Moines, Iowa, are engineers.

Manual training equipment will be installed in the two-story and basement junior high school, to be constructed at Indianola, Iowa, estimated to cost \$175,000, for which foundations will be laid at once. Keffer & Jones, Masonic Temple Building, Des Moines, are architects.

The Standard Oil Co., 910 South Michigan Avenue, Chicago, and Ninth Street, S. E., Mason City, Iowa, has plans for a two-story oil storage and distributing plant, 75 x 150 ft., estimated to cost \$100,000 including equipment. The engineering department of the company, Chicago office, is in charge.

The Pines & Wintergrant Co., 408 North Sacramento Boulevard, Chicago, has awarded a general contract to W. J. Scown, 36 West Randolph Street, Chicago, for a two-story addition, 125 x 130 ft., estimated to cost \$67,000. The company specializes in the manufacture of wire goods, fly traps, etc. William Gauger, 36 West Randolph Street, is architect.

Buffalo

BUFFALO, July 14.

J. T. WALSH, 500 Brisbane Building, Buffalo, has inquiries out for a steam shovel, crawler type, about 3/4-yd. capacity; also for three road rollers, about 8 and 10 tons capacity.

Motors, power equipment, conveying apparatus, etc., will be installed in the three-story addition to be erected at the printing plant of the *Buffalo Evening News*, 218 Main Street, Buffalo, 60 x 130 ft., to cost \$100,000. Plumber & Mann, 700 Main Street, are architects.

The R. E. Malone Co., 173 Broadway, Saranac Lake, N. Y., operating a general machine works, plans the installation of a number of machine tools, including lathe and attachments.

The Trico Products Co., 624 Ellicott Street, Buffalo, manufacturer of automobile equipment, is reported to be arranging a list of tools, etc., to be installed in an addition.

The Board of Contract and Supply, City Hall, Binghamton, N. Y., has asked bids on a general contract for a one-story power house in connection with an addition to the city hospital. The entire project will involve about \$1,000,000. Walter Whitlock, Security Building, is steam and electric engineer, in charge.

Daniel W. Martin, Buffalo, has applied for permission to operate a sheet metal works in a building to be erected at 842 Hertel Avenue, 75 x 140 ft., for which plans have been prepared.

The Niagara, Lockport & Ontario Power Co., Lafayette Building, Buffalo, plans the construction of a one-story automatic power substation at Altmar, N. Y., to cost \$500,000 with equipment.

Bids will be received until July 22 by the Department of Parks and Public Buildings, 13 City and County Hall, Buffalo, for furnishing ash handling equipment at the J. N. Adam Memorial Hospital power house, Perrysburg, N. Y. John H. Meahl is commissioner of parks and public buildings.

Fire, July 9, destroyed the plant of the A. Y. Bennett Mfg. Co., Alden, N. Y., manufacturer of steel cabinets, with loss of \$100,000.

Ground has been broken at Ogdensburg, N. Y., for a new plant along the lake front for the Coplan Steel Co. The main building will be 85 x 300 ft.

The City Council, Oswego, N. Y., contemplates the purchase of an automatic draft blower for the city boiler plant. M. H. Hellig is city clerk.

Cleveland

CLEVELAND, July 14.

MACHINE tool business continues dull with orders confined almost wholly to single machines. Most of the business during the week came from small jobbing shops, some of which are comfortably filled with work. The Cleveland Water Works Department has placed most of the machinery included in its recent list of a dozen tools. While inquiry is light, some machine tool manufacturers report a slightly better volume of inquiries and look for an increase in sales before the end of the month. However, no new demand is coming from the automotive industry which is usually the best source of machine tool business in this territory.

The Cleveland Worm & Gear Co., Cleveland, has acquired a two-acre site on East Eightieth Street near the Pennsylvania railroad and has placed contract with the H. K. Ferguson Co., Cleveland, for a \$100,000 plant. It will include a one-story main building, 150 x 240 ft. with wings for the boiler plant and heat treating department and an office building. Upon completion the company will move from its present quarters on East Fortieth Street. It advises that no additional machinery is needed.

The city of Ashtabula, Ohio, has taken bids on a new boiler house in which two boilers, stokers and other equipment will be installed.

The Bishop Products Co., 7512 Carnegie Avenue, Cleveland, will erect a two-story factory, 58 x 100 ft. at an estimated cost of \$35,000. George E. Bishop is president.

The village of Sunbury, Delaware County, Ohio, is having preliminary plans prepared for a waterworks system which will include pumps, pumping station and an elevated steel tank.

Contract has been awarded to the Crowell & Little Construction Co., Cleveland, for an eight-story building for the Ohio Bell Telephone Co. at Canton, to cost \$1,025,000.

About \$1,000,000 worth of equipment will be installed, to eventually give the city of Canton and surrounding districts machine switching service.

The Ideal Laundry Co., Toledo, Ohio, has awarded a general contract for a power house to cost \$50,000 for which considerable boilers and other equipment will be required. S. M. Jokel, Nicholas Building, Toledo, is the engineer in charge.

The Trump Rubber Co., Inc., East Akron, Ohio, has awarded contract for a one-story power house to cost \$25,000, for which considerable equipment will be purchased at once.

The Marion Steam Shovel Co., Marion, Ohio, is inquiring for a large testing machine, 400,000 to 800,000 lb. capacity.

South Atlantic States

BALTIMORE, July 14.

THE Holtson Mfg. Co., 119 East York Street, Baltimore, manufacturer of oil burners, engine repairs and which also conducts a general machine shop, has leased space at 115 and 117 East York Street and 116 and 118 Key Highway and will double its capacity.

The Mercantile Display & Fixture Co., 405 South Hanover Street, Baltimore, manufacturer of wooden store fixtures, will move to 212 South Sharp Street, where its floor space will be increased 100 per cent. Additional machinery will be installed. M. G. Mangano is manager.

Bids are being asked by the Bethlehem Steel Co., Bethlehem, Pa., for the construction of three one-story shops at its Sparrows Point plant, estimated to cost \$100,000 with equipment.

The general purchasing officer, Panama Canal, Washington, will take bids until Aug. 1 for a quantity of pipe and tubing, steel rope, steel staybolt iron, chain hoists, pneumatic tools, sash chain, chain links, copper, brass, bronze, sheet zinc, etc., circular 1619; until July 18 for bolts, nuts, rivets, twist drills, air compressor, hacksaw blades, insulated wire and other mechanical equipment, schedule 1618.

The Icyo Metal Products Co., Inc., Charlotte, N. C., recently formed with a capital of \$300,000, is said to be perfecting plans for the establishment of a factory to manufacture a combination refrigerating and dispensing beverage machine. E. C. Stothart, Charlotte, is president.

The General Gas & Electric Corporation, 50 Pine Street, New York, has acquired a controlling interest in the South Carolina Gas & Electric Co., Spartanburg, S. C., and will merge with its other properties in this vicinity. Plans are under way for extensions in power plant and system and the installation of additional equipment.

D. C. Elphinstone, Inc., 408 Continental Building, Baltimore, machinery dealer, is in the market for a stone crusher, air compressor, tripod drill, elevating equipment, jack hammers and other machinery for rock-quarrying service.

The naval appropriation act provides for the following work, for which plans will be drawn and bids asked by the Bureau of Yards and Docks, Navy Department, Washington, in the near future: Central power plant and distributing system improvements and extensions, Puget Sound Navy Yard, \$100,000; improving and fitting out pier at the same yard, \$250,000; electric capstans for dry dock, \$10,000, and circulating pumps for heating system, \$10,000, Portsmouth Navy Yard; repairs and improvements in the steam power and distributing system, Washington, D. C., Navy Yard, \$50,000; dredging equipment, \$150,000, mooring dolphins, \$28,000, and plant renewals naval coaling depot, \$57,500, at the Mare Island Navy Yard; power plant extensions and improvements, \$100,000, and marine railroad accessories house, \$20,000, for the Pearl Harbor, Hawaii, naval station; refrigerating plant addition at the naval station, St. Thomas, Virgin Islands; power and refrigerating plant at the naval station, Tutuila, Samoa; power plant extensions and improvements, \$120,000, and coaling-plant renewals at the naval station, Cavite, P. I.; additional dry dock facilities, Dry Dock No. 3, \$175,000, and improvements in foundry building, 42-C, \$45,000, at the Boston Navy Yard, and power plant extensions, \$10,000, at the naval torpedo station, Keyport, Wash.

The Common Council, Clinton, S. C., is said to be planning the installation of electric-operated pumping equipment in connection with a proposed waterworks plant and system estimated to cost \$90,000. An appropriation is being arranged.

The United Cleaners, Inc., P. O. Box 1652, Atlanta, Ga., is planning for the early installation of a direct-connected, engine-driven electric generator and auxiliary equipment, to develop a capacity of 150 kva.

Bids will be received by the Emergency Fleet Corporation, United States Shipping Board, Navy Building, Washington, until July 21 for furnishing 130,000 metal condenser tubes.



AN Outdoor Safety Rally Was Recently Held Under the Auspices of the Department of Safety and Factory Hygiene of the Ford Motor Co., at the Plant in Detroit of the Lincoln Motor Car Co. The attendants numbered 4379 and motion pictures on safety were shown together with comic and educational films. Music was furnished by the Ford band and several vocalists. The plan is to hold similar outdoor rallies at the Highland and Rouge plants of the Ford company

The Cornwell Lime & Marl Co., Winchester, Va., W. B. Cornwell, head, is planning the installation of power equipment on a 10-acre site recently acquired in Jefferson County, W. Va. Other machinery will also be purchased.

The Mineola Mfg. Co., Gibsonville, N. C., is planning for the electrification of its mill, replacing former steam-power service. Motors, controls and other electric equipment will be installed. J. E. Sirrine & Co., Greenville, S. C., are engineers.

M. Rocklin, 1505 North Smallwood Street, Baltimore, architect, will begin the erection of a two-story automobile service, repair and garage building, 76 x 180 ft., at Oak and Twenty-sixth Streets, estimated to cost \$100,000 with equipment.

T. L. Eberhardt, Chester, S. C., is in the market for one centrifugal pump and accessory equipment for a daily output of 800 gal. per minute.

The Mount St. Agnes College, Mount Washington Station, Baltimore, has awarded a general contract to Frainie Brothers & Haigley, 19 West Franklin Street, for a one-story power plant in connection with a new mechanical laundry estimated to cost \$75,000, for which foundations will be laid at once. Frank J. Baldwin, 328 North Charles Street, is architect.

The Bureau of Supplies and Accounts, Navy Department, Washington, will take bids until July 22 for augers, bits and drills, schedule 2419; for rivets, clamps, countersinks, etc., schedule 2418; for woodworkers' chisels and gouges, schedule 2412; screwdrivers, schedule 2413; shears, schedule 2414; hammers, hatchets and axes, schedule 2407; and for a quantity of tube expanders, schedule 2409.

The Moorac Sand Co., Junction City, Ga., has inquiries out for a cableway and buckets, hoisting equipment, gasoline engine and other apparatus. C. W. Moore is president.

G. W. Weldon, Westminster, S. C., is in the market for an ice-making machine, about 20 tons capacity, with accessory equipment.

Detroit

DETROIT, July 14.

WORK will begin on a one-story plant, 80 x 160 ft., on Dequindre Street, Detroit, for the Higgins Brass & Mfg. Co., estimated to cost about \$25,000.

The Ford Motor Co., Detroit, has acquired property at Dagenham, on the Thames River, England, totaling about 300 acres as a site for a new manufacturing and assembling works. Plans are being drawn for the initial buildings with a daily output of 500 cars. The estimated cost is \$3,000,000 including equipment.

The Piqua Handle & Mfg. Co., Marquette, Mich., is planning the erection of a one-story addition, 50 x 240 ft., to cost approximately \$25,000 including equipment.

The Flint Malleable Castings Co., Flint, Mich., has plans for the erection of a one-story foundry, for which foundations will soon be laid. Wright & Nice, Kearsley and Smith Streets, are architects.

The Great Lakes Distributing Co., Penobscot Building, Detroit, has acquired foundry sand properties totaling about 160 acres near Saginaw, Mich., and will install a complete plant for digging, conveying, shipping, etc.

Motors, controls, power equipment, conveying and other machinery equipment will be installed in the fourteen-story printing plant and works building to be erected by the *Detroit Free Press*, Detroit, estimated to cost \$2,720,000. Albert Kahn, 1000 Marquette Building, is architect.

The Berg Garage Co., 221 South Congress Street, Detroit, has preliminary plans for a new service, repair and garage building, 140 x 150 ft., to accommodate 600 cars, estimated to cost \$300,000 with equipment. Smith, Hinchman & Grylls, Marquette Building, are architects.

Considerable machinery, including transmission and conveying equipment, will be required in connection with an eight-story, 90 x 120 ft. garage and service station for the Detroit Garages, Inc., Detroit, Mich.

Milwaukee

MILWAUKEE, July 14.

ANOTHER week of extreme quiet has passed and even inquiry has fallen off further. The condition is not unusual for this period of the year, however. Many metal-working shops which have been running at minimum since July 1 or 3 are resuming operations today, and tool trade is expected to show a revival.

The Northern Refrigerator Car Co., a subsidiary of the Cudahy Brothers Co., meat packer, Cudahy, Milwaukee County, has let the general contract to the Worden-Allen Co. for a brick and steel car construction and service shop, 125 x 225 ft., one story. A limited quantity of new equipment will be purchased, but details have not been given out.

The Standard Sanitary Mfg. Co., Pittsburgh, has placed the general contract with W. W. Oefflein, Inc., 86 Michigan Street, Milwaukee, for a five-story manufacturing, warehousing and office building, 82 x 171 ft., at 1620-1630 St. Paul Avenue, local, estimated to cost \$250,000 or more. The Hunting-Davis Co., 1150 Century Building, Pittsburgh, architect and engineer, is formulating equipment needs.

Edward A. Julien, 208 Grand Avenue, Wauwatosa, Milwaukee County, has broken ground for a one-story machine shop, 50 x 100 ft., at 1620-1624 Holton Street, Milwaukee, and is in the market for a small list of tools.

The Automotive Parts Mfg. Co., West Bend, Wis., has been incorporated with a capital stock of \$25,000 to manufacture a general line of automotive materials, parts, equipment and accessories. An existing building has been taken over and the principal equipment necessities provided by the acquisition. C. E. McDonald and D. W. Walleman of

West Bend, and Oliver L. O'Boyle, attorney, 221 Grand Avenue, Milwaukee, are the principals.

The Spence & Barrett Auto Co., South Milwaukee, Wis., is taking bids until July 15 through Davis & Tuckwell, engineers, 332 Grove Street, Milwaukee, for the erection of a garage, sales and service building, 60 x 124 ft., two stories and part basement, to cost \$40,000.

The Milwaukee Board of School Directors, Frank M. Harbach, secretary and business manager, expects to be ready about Aug. 1 for estimates on furnishing and installing the miscellaneous shop equipment for the new service building, costing \$270,000, being completed at Eleventh and Prairie Streets. Details are not yet available.

Gulf States

BIRMINGHAM, July 14.

FOLLOWING recent organization, the Phoenix Machine Mfg. Co., Madison Street, Mobile, Ala., is arranging for the establishment of a plant to manufacture machinery and parts, with assembling department, estimated to cost \$80,000. V. P. McCoy is president and C. C. Constantine, secretary and treasurer.

The Airkool Spark Plug Co., Miami, Fla., recently organized, has acquired property on Twenty-ninth Street and contemplates the immediate erection of a new plant, 100 x 145 ft., estimated to cost \$125,000 with machinery. Kiehnel & Elliott, Miami, are architects. J. B. Harper is president and J. R. Tatum, vice-president.

The Oliver Ice Co., Fourteenth Street, N. W., Miami, Fla., contemplates the construction of a cold storage building and ice storage plant with capacity of about 2000 tons and has inquiries out for apparatus. L. C. Oliver is president, in charge.

The South New Orleans Light & Traction Co., New Orleans, has preliminary plans for rebuilding the portion of its power house, car shop and barns at Algiers, La., recently destroyed by fire with loss estimated at \$250,000 including equipment.

The Meyer Dairy Equipment Co., St. Louis, is arranging for the establishment of a factory branch and distributing plant at Dallas, Tex. The company has taken over this branch of the business of the Huey & Philip Hardware Co., Dallas, and will consolidate with its new branch. It is likely that a portion of the building of the last noted company will be occupied temporarily, later to be replaced with an individual works.

The Sunrise Laundry Co., Delaware and Third Streets, Fort Pierce, Fla., will install a steam power house at its laundry, including boilers and accessory apparatus. George R. Lord is secretary.

The Warren-Godwin Lumber Co., Jackson, Miss., plans to rebuild the portion of its mill recently destroyed by fire with loss estimated at \$150,000 including machinery. It is purposed to install electric-operated equipment.

The Southern Utilities Co., Bradentown, Fla., has awarded a general contract to O. P. Woodcock Co., Duvall Building, Jacksonville, Fla., for its proposed new power plant, to have an initial capacity of about 1000 kw. I. D. Hayes is local manager.

The Whiting Railway Motor Car Co., Gary, Fla., is contemplating the erection of a new plant in the vicinity of Plant City, Fla., estimated to cost \$75,000, for car manufacture and parts. J. A. Whiting is vice-president.

The Greenwood Separate School District, Greenwood, Miss., S. R. Keesler, president, plans the installation of manual training equipment in its proposed high school, estimated to cost \$150,000, for which bids have been asked on a general contract. Emmett J. Hull, Daniel Building, Jackson, Miss., is architect.

The Common Council, Houma, La., plans extensions and improvements in the municipal electric light and power plant, and waterworks station, estimated to cost about \$100,000 including equipment. A special election has been called to vote bonds.

The Interstate Investment Co., Tampa, Fla., is arranging for the installation of an ice and cold storage plant in connection with its proposed three-story storage warehouse, estimated to cost \$600,000. Lockwood, Greene & Co., Healey Building, Atlanta, Ga., are architects and engineers.

The Union Carbide & Carbon Co., 30 East Forty-second Street, New York, has tentative plans for new works in the vicinity of Houston, Tex., to be occupied by its Linde Air Products and Prest-O-Lite division. It is estimated to cost \$300,000 including equipment.

The Common Council, Davenport, Fla., contemplates the installation of electric-operated pumping equipment in connection with its proposed new waterworks, estimated to cost \$55,000. A bond issue is being sold.

Traveling ovens, electric motors, conveying and other equipment estimated to cost \$75,000 will be installed in an addition to the plant of the Seybold Baking Co., Miami, Fla. John Seybold is president.

St. Louis

ST. LOUIS, July 14.

FIRE, July 8, destroyed a portion of the car and locomotive repair shops of the Chicago, Rock Island & Pacific Railroad Co. at Shawnee, Okla., with loss estimated at \$500,000 including machinery. It is planned to rebuild. Headquarters of the company are at 179 West Jackson Boulevard, Chicago.

The Chickasha Cotton Oil Co., North Third Street, Chickasha, Okla., is considering the construction of a steam power house at its proposed cotton ginning plant at Davidson, Okla. A 125-hp. engine, boiler and accessory equipment will be installed.

The Leidecker Tool Co., Bartlesville, Okla., with branch plants for the manufacture of oil well tools, etc., at Marietta, Ohio, and Casper, Wyo., is disposing of a bond issue of \$300,000, a portion of the proceeds to be used for extensions and improvements.

The Willow Springs Light & Power Co., Willow Springs, Mo., will take bids at once for rebuilding the portion of its electric light and power plant recently destroyed by fire. The work will cost about \$55,000. Additional equipment will be installed. The Alexander Engineering Co., Woodruff Building, Springfield, Mo., is engineer in charge.

Grant Seeley, 4914 Delmar Street, St. Louis, and associates, are perfecting plans for a four-story automobile service, repair and garage building, 100 x 150 ft., estimated to cost \$100,000 including equipment.

The Tulsa County Commissioners, Water Improvement District No. 1, Tulsa, Okla., plans the installation of electric-operated pumping equipment in connection with improvements and extensions estimated to cost \$250,000, in which amount a bond issue is being arranged. The Benham Engineering Co., Gimbel Building, Kansas City, Mo., is engineer.

The Central Missouri Power & Water Co., Kansas City, Mo., has plans under way for a hydroelectric generating plant on the Gasconade River, near Waynesville, Mo. A power dam will be built, with hydroelectric station to consist of six or more water turbines with generators, each of about 5000 kw. capacity. A power transmission line will be built. The entire project will involve more than \$1,750,000. E. L. Williams, Clark E. Jacoby Engineering Co., Interstate Building, Kansas City, Mo., is engineer in charge.

The Marland Refining Co., Tonkawa, Okla., will erect a new oil storage and distributing plant estimated to cost \$90,000 including equipment.

The Common Council, Burlington Junction, Mo., contemplates the installation of electric power equipment in connection with its proposed waterworks plant and system estimated to cost \$55,000. A 50,000-gal. steel tank and tower will be installed.

Manual training and vocational departments will be installed in the new junior high school at Casper, Wyo., to cost \$700,000, for which a general contract has been awarded to Swanstorm & Broadland, Butte, Mont., on a bid of \$592,960.

Indiana

INDIANAPOLIS, July 14.

BIDS are being taken by the National Malleable Castings Co., 546 North Holmes Avenue, Indianapolis, for a one-story addition, 94 x 630 ft., estimated to cost \$200,000 including equipment.

The Remy Electric Division, Anderson, Ind., has taken over the manufacture of the products of the Klaxon Co., an interest of the General Motors Corporation, and will arrange facilities at its plant for the manufacture of automobile horns and signals. The Klaxon Co. will be operated in the future as a sales organization only.

The Krause Engine Co., Indianapolis, has arranged for the operation of new works at 806 Edison Street, for automobile engine parts, repairs, etc.

The Fort Wayne Corrugated Paper Co., Fort Wayne, Ind., will build a new one and two-story plant at Hartford City, Ind., 180 x 350 ft., estimated to cost \$250,000 including equipment. The majority of the machinery will be electrically-operated.

The Northern Indiana Power Co., Kokomo, Ind., has acquired the plant and property of the Farmers' Mutual Electric Light & Power Association, Sidney, Ind., and plans for extensions.

Rodney Leonard, Peoples Life Building, Frankfort, Ind., architect, has plans for a one-story automobile service, repair and garage building on local site. An electric crane, air compressors, tools and other equipment will be installed.

The Union Metal Products Co., 20 West Jackson Boulevard, Chicago, is reported to be planning for extensions, with additional equipment, in the plant of the Keith Railway Equipment Co., Hammond, Ind., recently acquired.

The Link Belt Co., Indianapolis, manufacturer of hoisting and conveying equipment, etc., has awarded a general contract to the Latham & Waters Co., State Life Building, for a one-story addition.

The Union Furniture Co., Batesville, Ind., has awarded contract to William A. Gutzwiller, Batesville Bank Building, for an addition estimated to cost \$80,000 with machinery. Considerable equipment will be electrically-operated.

The Marion Electric Corporation, Marion, Ind., formerly known as the Allmuer Mfg. Co., specializing in the manufacture of electric heating apparatus and appliances, has acquired the former plant of the Marion Baking Co. The present works will be removed to the new location and additional equipment installed.

The White Mfg. Co., Goshen, Ind., manufacturer of railroad supplies, contemplates erecting a plant in Elkhart, Ind., to replace a factory at Goshen destroyed by fire several months ago.

The C. D. Donato Cut Stone Co., Bedford, Ind., is in the market for a second-hand Yates knife grinder or one similar.

Pacific Coast

SAN FRANCISCO, July 9.

PLANs are being arranged by the Board of Works, Richmond, Cal., for a one-story municipal machine shop, 50 x 55 ft. H. D. Chapman is city engineer.

O'Keefe & Merritt, 251 South Avenue Seventeen, Los Angeles, manufacturer of sheet metal products, has plans for a new one-story factory, 170 x 350 ft., estimated to cost \$55,000. A. S. Nibecker, Washington Building, is architect.

The Pacific Fruit Express Co., 65 Market Street, San Francisco, has preliminary plans under advisement for new car and repair shops at Nampa, Idaho, estimated to cost \$400,000 with equipment.

The City Council, Fallon, Nev., is considering plans for the installation of a municipal electric power plant estimated to cost \$45,000.

The Golden State Box Co., 1200 East Eighth Street, Los Angeles, has acquired two acres at Burbank and has authorized plans for a two-story factory, 100 x 200 ft., for the manufacture of small wood boxes and cartons, estimated to cost \$38,000. Most of the equipment will be electrically operated.

The Portland Shipbuilding Co., Portland, is reported to have preliminary plans for rebuilding the portion of its shipyard on the Willamette River recently destroyed by fire with loss estimated at \$90,000.

P. T. Ludwick, 628 South Sycamore Avenue, Los Angeles, has filed plans for a one-story mechanical works, 50 x 120 ft., to manufacture automobile wheels and parts.

The Northwestern Electric Co., Portland, plans for the construction of a one-story automatic power substation at Vancouver, Wash., to cost approximately \$90,000 with equipment.

The General Petroleum Co., 310 Sansome Street, San Francisco, has acquired about seven acres at Linnton, Ore., and plans the construction of a new oil storage and distributing works to cost close to \$400,000 with equipment.

The Pacific Gas & Electric Co., 445 Sutter Street, San Francisco, will make extensions in its power substation at Meridian, Cal., estimated to cost \$35,000. Considerable additional equipment will be installed.

The Willamette Valley Lumber Co., Dallas, Ore., has preliminary plans for rebuilding the portion of its mills recently destroyed by fire with loss approximating \$165,000. Electric-operated equipment will be installed.

The Crystal Chemical Co., Anaheim, Cal., plans the installation of equipment for the manufacture of commercial fertilizer products. It is arranging a gross appropriation of about \$500,000 for expansion and machinery purchases.

The South Coast Land Co., Del Mar, Cal., has plans for the installation of a water distributing system, to include electric-operated booster pumping equipment and accessory apparatus. Robert F. Cowles, 740 South Broadway, Los Angeles, is engineer.

The Continental Supply Co., Kevin, Mont., mechanical equipment, plans the installation of a traveling crane in its proposed warehouse and distributing works, for which foundations will soon be laid. Clyde Glosser is local manager.

Canada

TORONTO, July 14.

DEMAND for machine tools continues favorable and buyers are entering the market for practically all lines of equipment. Sales, however, are mostly for one or two tools to a purchaser. The Canadian National Railways are receiving prices on machinery for the Montreal shops, and several other small lists have made their appearance the past few days.

Automobile plants are constantly in need of tools for replacement purposes and orders from this source are frequent. Second-hand and rebuilt tools are showing renewed life and several good sales were reported the past week. Small tools continue to move freely. While prices have been fairly steady for some time, there have been a few slight upward revisions by some manufacturers.

The sawmill owned by Eugene St. Pierre-Fils Joackim, St. Paul de la Croix, Que., recently destroyed by fire, will be rebuilt immediately and the owner is interested in the purchase of equipment.

A. Blanchard, Port Chateau, Que., is in the market for a lathe, drill press and emery grinder, etc.

J. R. MacDonald, Stratford, Ont., is in the market for equipment for a plant to cost \$50,000 to manufacture threshing machines.

W. A. Brown, Lennoxville, Que., is asking for planing mill machinery, including saws, planers and other wood-working tools.

J. A. McCracken, Chateaugay, Que., is asking for a bench lathe and other tools for an automobile repair plant.

The Pilot Mfg. Co., in which James G. Gairdner is interested, has purchased the building, land and equipment of the Perfect Machinery Co., Galt, Ont., and proposes to remodel and install additional machinery for the manufacture of milking machines, cream separators, dairy supplies, etc. It is also the intention to manufacture all-aluminum electric washing machines later.

The Galt Machine & Screw Co., Galt, Ont., has purchased the assets and patent rights of the Touring Car & Equipment Co. and will manufacture "Ever Ready" tops for the Canadian trade.

La Cle Electrique Lac Bouchette, Ltd., Lac Bouchette, Que., will start work soon on the erection of an electric power development plant to cost \$35,000.

The Brennan Paving Co., Ltd., Hamilton, Ont., is in the market for a 35 or 40-hp. locomotive type boiler.

The Farlinger Co. will soon start work on the erection of a pulp mill at Sioux Lookout, Ont. It also proposes to develop water power from the English River and has contracted to supply the town with light and power. A paper mill will be erected later.

The National Pulp Corporation, Ltd., Oshawa, Ont., has completed arrangements for the erection of a plant to cost \$75,000. The city will provide a site of 3 acres on which it will take a mortgage for \$1,500 per acre. The mill will be two stories, 60 x 100 ft.

The factory of the Conboy Carriage Co., on the Don Road and Queen Street, Toronto, was totally destroyed by fire July 10 with a loss to building and machinery of \$250,000. The company specialized in the manufacture of automobile parts and accessories, etc.

The Canada Foundries & Forgings, Ltd., Brockville, Ont., is inquiring for a machine for hollow boring steel shafting up to 45 ft. in length, diameter of the hole up to 4 or 5 in. H. F. Varese is purchasing agent.

Western Canada

C. N. Heuber, Kitchener, Ont., manufacturer of furnaces and heating appliances, etc., is arranging for the establishing of a branch factory at Winnipeg.

The Canadian Chemical Pulp & Paper Co. will erect a plant at Winnipeg, to cost \$1,200,000, for the manufacture of pulp from straw. It is the intention of the company to make use of the large quantities of straw now burned throughout western Canada as useless. The De Vains process will be used.

The town of Radville, Sask., will start work in the early future on the construction of power plant to cost \$27,000. A. A. Murphy, Saskatoon, Sask., is the consulting engineer.

The ratepayers of Vancouver, B. C., have carried a by-law authorizing the expenditure of \$150,000 on additions to waterworks plant, for which bids will be called. C. Brackenridge is city engineer.

Plans of New Companies

The Advance Boiler Corporation, 5930 Grand Central Terminal, New York, recently incorporated with \$250,000 capital stock, will manufacture boilers, tanks and other plate products. It has taken over the business of a manufacturer established nearly two years ago. The plant at Poughkeepsie, N. Y., is being operated at nearly full capacity, under new principals and new capital. Present capacity will be enlarged in the near future. H. Dunbak is president; C. Hensel, treasurer, J. Patten, vice-president, and W. H. Dunbak, secretary.

The Ballard Oil Equipment Co. of New Jersey, 120 Broadway, New York, has been incorporated with 10,000 shares of common stock and 2000 shares of preferred, to manufacture oil burning equipment, ranging from domestic equipment to the larger apparatus used in any steam plant. Branches of the company have been formed in various other cities. The main plant is located in Boston. Recently an oil terminal, consisting of complete oil handling equipment and plant of 16,000 sq. ft. on six and a half acres in Newark, N. J., was acquired. The several Ballard branches purchased steel tanks in sizes ranging from 250 gal. up to 30,000 gal. Some electric equipment, castings, etc., also are used. Electric motors are purchased in lots of 1000 by the New York office for all branches, as is also the case with tank trucks. A. H. Ballard is president.

The Research Engineering Corporation, 392 Fifth Avenue, New York, is engaged in the development of several industrial inventions and is organizing a new corporation through which all foreign interests will be handled. Edward F. Chandler, vice-president and consulting engineer, is in charge of this work.

The Four-in-one-Jack Corporation, care of A. D. Schanzer, 15 Park Row, New York, has been incorporated with \$200,000 capital stock, to manufacture automobile jacks and other heavy hardware products. Plans will be announced more fully in a later issue.

The R. Kohl Diamond Die Co., 653-55 Broad Street, Newark, N. J., has been organized for the manufacture and importation of Diamond dies for wire drawing, and diamond tools in general. Richard Kohl, who heads the company, previously was in partnership with F. Krause & Co. in Jersey City, N. J., in a similar line. Machinery and material are on hand.

The Domestic Sales Engineering Corporation, 459 Central Avenue, Newark, N. J., recently incorporated with \$50,000 capital stock, will act as director of oil burning equipment. Ira A. Kip is president.

The Spotlight License Plate & Mfg. Co., care of Charles C. Gill, 253 Broadway, New York, has been organized to manufacture license plates for automobiles. Definite plans have not yet been formulated.

The S. & G. Iron Works, Inc., care of Stein & Stein, 305 Broadway, New York, has been organized to engage in general iron work, particularly in making fire escapes, stairways and ornamental iron.

The Rance Corporation, 41 East Forty-second Street, New York, has been organized as distributor of radio parts and equipment.

Duncan Mackenzie's Sons Co., Inc., Trenton, N. J., has been organized with \$50,000 capital stock to operate as iron founder, specializing in wire mill machinery and equipment, also in Mackenite heat resisting metal. It has taken over the business of a going concern. Duncan Mackenzie is president and general manager, and Joseph W. Mackenzie, secretary-treasurer.

The Borschel Metal Products Co., care of the Peerless Engineering Service Co., 638 Bramson Building, Buffalo, has been organized with \$25,000 capital stock to manufacture valve silencers for the automotive trade. Manufacturing will be done by contract, the parent company operating an assembling plant.

The Interstate Body Corporation, 734 Ferry Street, Newark, N. J., has been organized as distributor of steel dump bodies and products of the Mifflinburg Body Co., Mifflinburg, Pa., and the Stoughton Wagon Co., Stoughton, Wis. John D. Lyman heads the company.

The Adams Equipment Co., Inc., Watertown, N. Y., has been organized with \$150,000 capital stock to manufacture and distribute freight handling equipment and other labor saving devices. For the present it is specializing in removable bodies for hand trucks. Manufacturing will be done by contract in lots of 1000. Contracts for manufacturing equipment in smaller lots have been placed with Spies Bros. & Gould, Inc., Adams, N. Y.

The Watig Co., Inc., Wrightstown, N. J., has been organized with \$25,000 capital stock and will act as distributor of hardware and farmers' supplies. Herman Croshaw is head.

The American Motor Body Corporation, 1800 West Lehigh Avenue, Philadelphia, has organized a new unit, known as the Six Wheel Co., to manufacture auto buses. Immediate manufacturing will be done by the American Motor Body Corporation, under contract. John B. Kilburn is treasurer.

The Scofield-Hendricks Co., 61 Allyn Street, Hartford, Conn., organized with \$50,000 capital stock, will act as wholesaler of electrical supplies. R. E. Hendricks is secretary-treasurer.

The Loeb Hardware Co., Montgomery, Ala., organized with \$100,000 capital stock, has taken over the business of a former partnership, operated as wholesaler in automobile accessories and hardware. M. Loeb is president.

The Arrowhead Iron Works, care of S. H. Richards, Richards & Conover Hardware Co., Kansas City, Mo., has been organized with \$100,000 capital stock, to manufacture steel grating and stair treads, for use in industrial plants and for fire escapes. Manufacturing is being planned on a large scale. William L. Pattison is president; Walter B. Richards and John A. Conover, vice-presidents; Joseph E. Woodmansee, treasurer; and S. H. Richards, secretary.

The Hughesville-DeTektor Radio & Cabinet Co., Hughesville, Pa., organized with 2500 shares of stock, no par value, will manufacture radio apparatus. The company has leased a plant which is now in operation, but plans to build at a later date.

The Rochester Master Body Corporation, 1044 University Avenue, Rochester, N. Y., has been organized to install bodies on Ford chassis. Robert P. Judd is president.

The Abelman Auto Top Co., Beaumont, Tex., organized with nominal capital, will operate a general repair plant. L. Gordon is secretary.

The Carolina Radio Corporation, 16 South Poplar Street, Charlotte, N. C., has been organized as jobber in general radio equipment. W. Erdman Love is president and treasurer.

The Radiotive Corporation, 5317 Twenty-first Avenue, Brooklyn, has been incorporated with \$1,000,000 capital stock to manufacture radio equipment and parts. It has factory and equipment, having been in operation for some time. L. Schmidt and L. Schmidt, Jr., head the company.

The American Register Corporation, incorporated with \$500,000 capital stock, plans to manufacture heating equipment. Considerable capital has been invested in the project and the company will locate its plant wherever it seems most suitable. Temporary address is in care of Mr. Fried, Vause & Vause, 42 Broadway, New York.

The Safety Non-Skid Tire Protector Co., Brooklyn, has been incorporated with \$600,000 capital stock to manufacture tire chains. Although plans are not definitely drawn it is likely that manufacturing will be done in a plant of its own. I. W. Glasser, 221 Lewis Avenue, is one of the principals.

Munn & Draper, 51 East Forty-second Street, New York, incorporated with \$50,000 capital stock, will act as distributor of heating devices. Their products will be chiefly those manufactured by the Combustion Specialty Corporation, 250 West Fifty-fourth Street, New York. H. A. Munn and W. E. Draper are the principals.

The Auto Parts & Radio Co., Chester, S. C., has been organized as distributor of accessories and supplies for the automotive trade and also of radio equipment. H. S. McKeown is manager.

The Unit Gas Furnace Co., Inc., Syracuse, N. Y., has been organized with \$300,000 capital stock, to manufacture furnaces. Immediate operations will be conducted in the plant of the Carhart Bros. Foundry, Inc., 1618 North Salina Street, Syracuse, but it is likely that other arrangements will be made later. It is planned to have the furnaces on the market by fall. M. M. Baird is president; H. A. Carhart, vice-president; J. P. Goettel, treasurer and R. L. Manier, secretary.

The Pines Winterfront Co., 404-24 North Sacramento Boulevard, Chicago, has been organized as a consolidation of the Industrial Mfg. Co. and the Pines Mfg. Co., whose managements in the past have been closely allied. J. F. Raleigh, is secretary-treasurer.

The Auto Parts Service Co., Bangor, Me., organized with \$50,000 capital stock, will act as jobber in replacement parts for the automotive trade.

The Blairsville Hardware Co., Inc., Indiana, Pa., recently organized with \$30,000 capital stock, all paid in, will act as distributor of hardware products and tools. J. M. Stewart and A. W. Mabon head the company.

NEW TRADE PUBLICATIONS

Tanks.—W. E. Caldwell Co., Louisville, Ky. Booklet of 51 pages, 5 x 8 in., with illustrations, describing methods of construction and materials used in making this line of tanks and towers, giving also tables of dimensions and price lists.

Air Filters.—Reed Air Filter Co., 616-28 Barret Avenue, Louisville, Ky. Bulletins Nos. 106 and 108 of four pages each, 8½ x 11 in., with illustrations, discussing the expediency of air filtration and the adaptability, capacity and method of operation of the Reed filtration system.

Superheated Steam Pyrometers.—The Superheater Co., 17 East Forty-second Street, New York. Instruction book of 23 pages devoted to installation, operation and maintenance of the company's model 496 superheated steam pyrometers. Instructions given apply primarily to application of the pyrometer to superheater locomotives, but instructions relating to marine and industrial plants are also given. A pyrometer test set is described.

Thread Gages.—John-Sons Gage Works, Hartford, Conn. Booklet of 48 pages in which five styles of screw thread gages and modified forms of these gages are described and illustrated. Setting plugs, gage vises and gage fixtures are also shown and several pages are devoted to the company's screw thread lead tester and comparator, which was described in THE IRON AGE of June 26.

Drafting Room Equipment.—C. F. Pease Co., 813 North Franklin Street, Chicago. Attractive catalog, designated as F-24 and devoted to drawing boards, drawing stands and a wide variety of drawing tables. Wood and steel stools and filing cabinets of wood and steel for drawings and tracings are described and illustrated in several pages. The company's universal drafting machine and other equipment are included.

Bakelite Molding Materials.—Bakelite Corporation, 247 Park Avenue, New York. Booklet of 35 pages, 7½ x 10½ in. Information is given on Bakelite molding materials and their uses, the molding process and equipment being also described and illustrated. There are numerous illustrations of Bakelite products.

Hytempte in the Power Plant.—Quigley Furnace Specialties Co., 26 Cortlandt Street, New York. 20-page catalog showing the use of a bonding mortar for fire brick exposed to high temperatures. The catalog gives illustrations of its use, showing thin joints and indicating the strength of the bond. Boiler repair jobs are shown, as well as the initial work, and much information is given as to methods of use, methods of making repairs, etc. In particular, the use of crushed old fire brick for patching and rebuilding furnace walls and making monolithic baffles is described and illustrated.

Resilient Bumpers.—Metal Stamping Co., Long Island City, N. Y. 24-page catalog devoted to the Lyon bumper and attachments. This bumper is made in several styles illustrated in the catalog and is designed to prevent damage to automobiles when colliding with others or with stationary objects. The individual types of bumpers are covered also in loose-leaf form.

Diesel Engines in Industry.—Fulton Iron Works Co., St. Louis. Four-page folder illustrating Fulton-Diesel engines in cement mills, iron mines, flour mills, ice plants, sugar mills and clay products plants. The engine is shown connected to electric generators and also with rope drive.

Oil Burner.—Bear Combustion Co., York, Pa. Eight-page pamphlet devoted to a system for burning oil in domestic heating apparatus, in place of coal. The system includes a siphon atomizer for the oil, a blower for the air, and various auxiliary apparatus to insure the proper working of the system.

Steam Purifiers.—Andrews Bradshaw Co., Pittsburgh. 36-page catalog devoted to the Tracey steam purifier for powerhouse work. It is designed to prevent impurities or particles of moisture from leaving the boiler drum with the steam, and has the idea of delivering clean dry steam. The catalog shows details and methods of application, both in photographic and diagrammatic form. It illustrates also some of the disorders in turbines caused by wet or dirty steam. The effect of the clean product is to decrease lubricating costs, steam consumption and expensive overhauling and repairs.

Fans.—Buffalo Forge Co., Buffalo, N. Y. A well illustrated circular, designated form 1903, describing

man-cooler fans, their application and effect; of interest to steel mills and foundries.

Oxy-acetylene Apparatus.—Oxweld Acetylene Co., Long Island City, Chicago and San Francisco. A 48-page catalog illustrating and describing in detail an extensive line of acetylene generators and oxy-acetylene welding, cutting, brazing, lead burning, heating and decarbonizing equipment. The book is replete with information useful to the user or prospective user of oxy-acetylene apparatus.

Punches and Shears.—Morgan Engineering Co., Alliance, Ohio. Bulletin No. 28, 32 pages. Several large motor-driven guillotine plate shears built for various steel companies are illustrated. Bloom shears, side-cut billet shears, scrap shear, duplex angle and bloom shear, open-side plate and angle shear, double punches and shears and various hydraulic punches and shears are among other full page illustrations.

Overhead Traveling Cranes.—Morgan Engineering Co., Alliance, Ohio. Bulletin No. 24, 32 pages. The company's standard crane is illustrated and briefly described and details are given on the standard end carriage, compensating truck, and "all-steel" mill-type bridge. Standard trolleys with mechanical brake and arranged also for dynamic control and with auxiliary hoist are illustrated and described. Several installations of cranes of various capacities and spans in use in steel mills, railroad and other shops are shown.

Safety Limit Stop.—Morgan Engineering Co., Alliance, Ohio. Bulletin No. 29, devoted to description of design and operation of the Wackerly type safety limit stop. The method of mounting the device on a typical crane trolley is shown.

Automatic Lathe.—Lodge & Shipley Machine Tool Co., Cincinnati. Booklet of 16 pages under the title of "How it Is Done on the Lodge & Shipley Duomatic" gives a concise general description of the Duomatic lathe, which was described in THE IRON AGE of May 29. Several illustrations of work done by the machine are included.

Metal Parts Washing Machine.—Colt's Patent Fire Arms Mfg. Co., Hartford, Conn. Attractive 15-page booklet describing the construction and operation of the company's Autosan metal parts washing machine, models 21A, B and C. Some of the special purpose Autosan machines built by the company are also described and specifications of the various machines are given.

Cold Sawing Machines.—Earle Gear & Machine Co., 4707 Stenton Avenue, Philadelphia. Booklet of 16 pages, 3½ x 8½ in. under title of "Economy in Cold Sawing." Component elements of the Lea-Simplex cold cutting-off saws are described and illustrated and samples of work and specifications of the Nos. 15, 18, 21, 24 and 26 machines are given. Data are also given on the Simplex hand-grinding and beveling machine, which is intended for both sharpening the saw teeth and beveling the cutting points.

Gears.—Hindley Gear Co., 1105 Frankford Avenue, Philadelphia. Catalog No. 6, 76 pages 7 x 9 in. Several pages are devoted to dimensions of Hindley worm gears of various leads from 0.2068 to 9.424 in., dimensions of the company's spirals, which are available with any ratio from less than 1 to 1 up to and including ratios of 20 to 1, being also given. Standard hobs for cutting straight worm gears are listed and data are given on several standard patterns for worm gear housings. Various worm gear drives are illustrated, as well as lead, power and feed screws manufactured by the company. Cut spur, bevel and miter gears of cast iron, steel or bronze are also available.

Surface Grinding Machines.—Blanchard Machine Co., Cambridge, Mass. Booklet devoted to the No. 16-A automatic surface grinder designed for the quantity production of small pieces. The features of the machine are described and the illustrations include views of work that may be done, the production records on the work illustrated being given. The operation of the hand loading, dial loading and magazine loading types of machines is outlined, as well as the use of fixtures with automatic clamping. Complete specifications are given.

Air Hoists and Trolley.—Hanna Engineering Works, 1765 Elston Avenue, Chicago. Circular briefly describing several styles of air hoists and also plain and geared I-beam roller-bearing trolleys.

Grinder Chucks.—Graham Mfg. Co., Providence. Circular H of four pages giving dimensions and general features of pressed steel grinder chucks or abrasive ring holders. They are available in nine sizes to hold 10-in. to 36-in. rings, and may be equipped with hubs to suit a variety of spindles.

Current Metal Prices

On Small Lots, Delivered from Merchants' Stocks, New York City

The following quotations are made by New York City warehouses.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipments in carload lots from mills, these prices are given for their convenience.

On a number of items the base price only is given, it being impossible to name every size.

The wholesale prices at which large lots are sold by manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE under the general heading of "Iron and Steel Markets" and "Non-Ferrous Metals."

Bars, Shapes and Plates

Bars:	Per Lb.
Refined iron bars, base price	3.34c.
Swedish charcoal iron bars, base	6.75c. to 7.00c.
Soft steel bars, base price	3.34c.
Hoops, base price	4.59c.
Bands, base price	4.09c.
Beams and channels, angles and tees, 3 in. x ¼ in. and larger, base	3.44c.
Channels, angles and tees under 3 in. x ¼ in., base	3.34c.
Steel plates, ¼ in. and heavier	3.44c.

Merchant Steel

	Per Lb.
Tire, 1½ x ½ in. and larger	3.35c.
(Smooth finish, 1 to 2½ x ¼ in. and larger)	3.60c.
Toe-calk, ½ x ¼ in. and larger	4.30c.
Cold-rolled strip, soft and quarter hard	7.00c. to 8.00c.
Open-hearth spring steel	4.50c. to 7.00c.
Shafting and Screw Stock:	
Rounds	4.25c.
Square, flats and hex.	4.75c.
Standard tool steel, base price	15.00c.
Extra tool steel	18.00c.
Special tool steel	23.00c.
High-speed steel, 18 per cent tungsten	70c.

Sheets

Blue Annealed

	Per Lb.
No. 10	4.14c.
No. 12	4.19c.
No. 14	4.24c.
No. 16	4.34c.

Box Annealed—Black

	Soft Steel C. R., One Pass Per Lb.	Blued Stove Pipe Sheet Per Lb.
Nos. 18 to 20	4.45c. to 4.70c.	
Nos. 22 and 24	4.60c. to 4.85c.	5.10c.
No. 26	4.65c. to 4.90c.	5.15c.
No. 28*	4.75c. to 5.00c.	5.25c.
No. 30	4.95c. to 5.20c.	

Galvanized

	Per Lb.
No. 14	4.85c. to 5.10c.
No. 16	5.00c. to 5.25c.
Nos. 18 and 20	5.15c. to 5.40c.
Nos. 22 and 24	5.30c. to 5.55c.
No. 26	5.45c. to 5.70c.
No. 28*	5.75c. to 6.00c.
No. 30	6.25c. to 6.50c.

*No. 28 and lighter, 36 in. wide, 20c. higher.

Welded Pipe

Standard Steel		Wrought Iron	
Black	Galv.	Black	Galv.
½ in. Butt...	—41 —24	½ in. Butt...	—4 +19
¾ in. Butt...	—46 —32	¾ in. Butt...	—11 +9
1-3 in. Butt...	—48 —34	1-1½ in. Butt...	—14 +6
2½-6 in. Lap.	—44 —30	2 in. Lap...	—5 +14
7-8 in. Lap...	—41 —11	2½-6 in. Lap.	—9 +9
9-12 in. Lap.	—34 —6	7-12 in. Lap.	—3 +16

Bolts and Screws

Machine bolts, cut thread,	50 to 60 per cent off list
Carriage bolts, cut thread,	40 to 40, 10 and 10 per cent off list
Coach screws, 50 and 10 to 60 per cent off list	
Wood screws, flat head iron,	75, 20 and 10 per cent off list

Steel Wire

	Per Lb.
Bright, basic	4.25c. to 4.50c.
Annealed soft	4.50c. to 4.75c.
Galvanized annealed	5.15c. to 5.40c.
Coppered basic	5.15c. to 5.40c.
Tinned soft Bessemer	6.15c. to 6.40c.

*Regular extras for lighter gage.

Brass Sheet, Rod, Tube and Wire

BASE PRICE

High brass sheet	16¼c. to 17¼c.
High brass wire	16¼c. to 17¼c.
Brass rods	14 c. to 15 c.
Brass tube, brazed	24¼c. to 25¼c.
Brass tube, seamless	20½c. to 21½c.
Copper tube, seamless	21¼c. to 22¼c.

Copper Sheets

Sheet copper, hot rolled, 19½c. to 20c. per lb. base.	
Cold rolled, 14 oz. and heavier, 3c. per lb. advance over hot rolled.	

Tin Plates

Bright Tin	Grade "AAA" Charcoal 14x20	Grade "A" Charcoal 14x20	Coke—14 x 20	Prime	Seconds
			80 lb.	\$6.55	\$6.30
			90 lb.	6.65	6.40
	IC.. \$11.75	\$9.50	100 lb.	6.75	6.50
	IX.. 13.25	11.50	IC..	7.00	6.75
	IXX.. 14.50	12.50	IX..	8.25	8.00
	IXXX.. 15.50	13.75	IXX..	9.50	9.25
	IXXXX.. 16.50	14.75	IXXX..	10.75	10.50
			IXXXX..	12.00	10.75

Terne Plates

8 lb. coating, 14 x 20

100 lb.	\$7.00 to \$8.00
IC	7.25 to 8.25
IX	8.25 to 8.75
Fire door stock	9.00 to 10.00

Tin

Straits, pig	46c.
Bar	48c. to 53c.

Copper

Lake ingot	16 c.
Electrolytic	15½c.
Casting	14¼c.

Spelter and Sheet Zinc

Western Spelter	7½c.
Sheet zinc, No. 9 base, casks	10½c. open 11¼c.

Lead and Solder*

American pig lead	8¼c. to 8¼c.
Bar lead	11c. to 12c.
Solder, ½ and ½ guaranteed	33¼c.
No. 1 solder	31¼c.
Refined solder	27¼c.

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal

Best grade, per lb.	75c. to 90c.
Commercial grade, per lb.	35c. to 50c.
Grade D, per lb.	25c. to 35c.

Antimony

Asiatic	10½c. to 11c.
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Aluminum

No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting, per lb.	36c.
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Old Metals

Business continues quiet with little change in values. Dealers' buying prices are nominally as follows:

	Cents Per Lb.
Copper, heavy crucible	10.50
Copper, heavy wire	10.00
Copper, light bottoms	8.25
Brass, heavy	6.00
Brass, light	5.00
Heavy machine composition	7.50
No. 1 yellow brass turnings	6.50
No. 1 red brass or composition turnings	7.50
Lead, heavy	6.00
Lead, tea	4.25
Zinc	3.50
Cast aluminum	15.00
Sheet aluminum	15.00